

9. PALUDESTRINA WISEMANIANA.

Shell elongately conical, thin, semidiaphanous, epidermis light green; apex acute; whorls 6 to $6\frac{1}{2}$, convex, smooth, grooved at the suture; aperture ovate; margins continuous, moderately thickened, columellar margin reflected, outer lip edged with green and reflected.

Length 2 lines, breadth 1 line.

Hab. Near Hobart Town, Tasmania; common in all the creeks (*Legrand* and *Petterd*).

I take this opportunity of correcting a few errors that I have made in a previous paper in these 'Proceedings.'

Helix (Charopa) ammonitoides to be altered to *Helix (Charopa) bassi*.—Proc. Zool. Soc. 1870, p. 661.

Helix (?Charopa) dispar to be altered to *Helix (Pityis) dispar*.—Proc. Zool. Soc. 1870, p. 661.

This species is the only one I know of in Tasmania with the small tooth in the interior of the aperture. We have *H. bisulcata*, said to come from the same locality, but none so small as the present species, which is somewhat like one that I have from Norfolk Island.

A second communication from Mr. John Brazier, contained some remarks on previously described species of Land-Shells, and stated that *Helix quintalæ* of Cox, P. Z. S. 1870, p. 82, should have been written *quintali*, having been named at Mr. Brazier's request in honour of Mr. Arthur Quintal, jun., of Norfolk Island; also that *Helix ardua*, Cox, P. Z. S. 1870, p. 82, had been collected by Mr. Brazier at Vanua Lava, Banks's Group, as well as at Erromanga. The name *Helix vannæ lavæ*, Cox, P. Z. S. 1870, p. 82 (lege *vanuæ lavæ*) was stated to be a misnomer, the species not occurring in the island of that name.

December 5, 1871.

John Gould, Esq., F.R.S., V.P., in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the months of October and November 1871:—

The total number of registered additions to the Society's Menagerie during the month of October 1871 was 95, of which 5 were by birth, 45 by presentation, 31 by purchase, 4 by exchange, and 10 were received on deposit. The total number of departures during the same period by death and removals was 106.

The most noticeable additions during the month of October were as follows:—

1. A third collection of animals from Chili, purchased (as on two

former occasions, from Mr. Weisshaupt) on October 4th. This consisted of the following animals :—

- 2 Andean Geese, *Bernicla melanoptera*.
- 2 Magellanic Geese, *Chloëphaga magellanica*.
- 1 Chiloe Wigeon, *Mareca chiloensis*,
- 2 Chilian Teal, *Querquedula creccoides*.
- 9 Pampas Cats, *Felis passerum**.
- 1 Spectacled Bear, *Ursus ornatus*.

Of these, the Chilian Teal and the Spectacled Bear (which has been deposited with the Society for safe custody since the 16th May, 1871) are new to the Society's collection.

2. A Cape Eared Seal (*Otaria pusilla*), presented by H.E. Sir Henry Barkly, C.M.Z.S., October 5th. Sir Henry Barkly, having obtained three living examples of this species at Cape Town, sent them home to the Society by the steamship 'Norseman,' under the kind care of Capt. Coxwell. Sir Henry, in a letter, dated Government House, Cape Town, September 17, states that the animals sent were all young females, from six to eight months old, the males captured on the same occasion having either died or escaped. Of the three examples transmitted, only one survived to reach the gardens, where it is doing very well, being fed principally upon sprats and other small fishes. This *Otaria*, in general form and shape, as will be seen by the sketch exhibited, is not very different from our female *Otaria jubata*. It is, however, of very much smaller dimensions, measuring only about 2 feet 6 inches in length. Perhaps the most noticeable external point of difference is the large size of the external ears, which measure about $1\frac{1}{4}$ inch in length. The front flippers appear also to be proportionally shorter than in *O. jubata*.

The total number of registered additions to the Society's Menagerie during November was 49, of which 1 was by birth, 34 by presentation, 9 by purchase, 3 by exchange, and 2 were received on deposit. The total number of departures during the same period by death and removals was 121.

The most noticeable additions were as follows :—

1. Maleo bird, *Megacephalon maleo*, presented by Capt. Parish, R.N., November 6th.

Capt. Parish informs me he obtained this rare Celebean bird in St. Helena out of a vessel coming from Java. Only upon one previous occasion, I believe, has the species been before exhibited in the Society's Gardens; and that was many years ago.

2. A male Chinese Pucras, *Pucrasia xanthospila*, presented by the Duke of Wellington, K.G., November 10th.

A few days subsequently, a female of the same species, which had been placed in the gardens on deposit, was purchased; so that the Society is now, for the first time, in possession of a pair of this fine Pheasant, which it is hoped will breed next season.

* I propose thus to write the specific name instead of the Spanish "*pajeros*," which is neither "Latin" nor "like Latin."—P. L. S.

3. Two Grey Seals (*Halichærus grypus*) purchased November 11th, through the kind agency of Mr. Samuel Williams of St. Davids, Pembrokeshire. Though the Grey Seal is said to be not uncommon on some parts of the British coast, we have never previously succeeded in obtaining living specimens of it.

From what Professor Flower informs me, I am now induced to believe that all the Seals of the genus *Phoca* (except the Greenland Seals, *Phoca grænlandica*) hitherto received alive by the Society have been referable to the *Phoca vitulina*, the specimens to which we have applied the name of *Phoca fœtida*, as in the 'Catalogue of Vertebrates,' 4th edit. p. 27, having been simply large specimens of the former species.

4. A fine young male Scæmmerring's Antelope (*Gazella scæmmerringii*), presented by Charles M'Iver, jun., Esq., on the 29th of November.

Mr. M'Iver informs me that the animal was obtained in the desert about 100 miles south of Suez.

Mr. Sclater read the following extracts from a letter addressed to him by Dr. Burmeister, F.M.Z.S. (dated Buenos Ayres, Oct. 10, 1871), containing some remarks on Messrs. Sclater and Salvin's Synopsis of the Cracidæ (P. Z. S. 1870, p. 504):—

1. *Mitua tuberosa*, P. Z. S. 1870, p. 520.—We have a magnificent male of this species from Santa Cruz de la Sierra, in Bolivia, where a collector from Buenos Ayres has lived some years, and made a valuable collection. My specimen is beautiful, 31 inches long, and of very splendid colours.

2. *Crax sclateri*, *ibid.* p. 515.—We have a beautiful female of this *Crax*, also from Santa Cruz de la Sierra, and another young female from Paraguay, the latter being somewhat smaller, and not so strongly coloured; but the differences are not of importance.

3. *Pipile cumanensis*, *ibid.* p. 529.—We have two specimens of this species, also from Santa Cruz de la Sierra, both excellent skins and entirely perfect. The white *pileus* advances to the beak, and is divided on the neck into two stripes, one on each side, descending nearly to the end of the neck. In all other respects it agrees with your description.

4. *Penelope boliviana*, *ibid.* p. 526.—Of this species also two specimens are in our collection from the same locality, agreeing with your definition, but larger, of 30 inches total length, and the feathers of the *pileus* all bordered with whitish, like those of the neck and back. The underside is obscure castaneous down to the beginning of the breast, but here mixed with greenish brown, like the back*.

5. *Ortalida guttata*, *ibid.* p. 536.—This bird we possess from the same locality, entirely corresponding with your definition.

6. *Ortalida canicollis*, *ibid.* p. 534.—This is the only species of the Penelopine group occurring in the interior of this country,

* It seems more probable that this may be *Penelope sclateri*, G. R. Gray.—P. L. S.

and advances furthest to the south. I have seven specimens from the woody district of Tucuman, near Invernada (see my *La-Plata Reise*, ii. p. 499), where the bird was found to be common. It is esteemed good meat, and I have eaten it with pleasure.

The species named in the same work *Penelope pipile* is that which you call *Pipile cumanensis*, and occurs also, but rarely, in the woods of Tucuman, where is likewise found, and not so rarely, *Penelope boliviiana*. I have seen there two specimens just killed in the woods, and presented to a friend of mine, who was intending to make a good dinner of them with his friends. It is also said that a species of *Crax* lives in the same forests; but I have not yet seen specimens of it. I suppose it must be *Crax sclateri*.

Mr. Sclater exhibited a skin of the Water-Opossum (*Chironectes variegatus*), which had been sent to him by Mr. Robert B. White, C.M.Z.S., from Medellin, U.S. of Columbia. Mr. White stated that this animal was abundant in the river Medellin (a confluent of the Cauca), which, Mr. Sclater observed, was quite a new locality for it*.

Dr. E. Hamilton exhibited a skull of the new Chinese Deer lately described by Mr. Swinhoe (P. Z. S. 1870, p. 89) as *Hydropotes inermis*, and made the following remarks:—

"I exhibit an adult skull of *Hydropotes inermis*, being the first mature specimen which has been sent to this country, those obtained by Mr. Swinhoe being the skulls of young animals. The animal from which this skull was taken was shot in the beginning of this year by Mr. T. Annett in the marshy grounds bordering the Yangtze river, about forty miles from Shanghai. I shall leave the minute description of the skull of this interesting animal to those more qualified than I am, merely remarking that this skull differs from the general description given by Mr. Swinhoe in its larger size, measuring 7 inches in length. There are also six perfect molars on each side, in Mr. Swinhoe's specimen only five. The canine teeth measure $2\frac{3}{4}$ inches when out of the jaw, 2 inches when *in situ*; in Mr. Swinhoe's specimen they measure only 1.1. Unfortunately the lower jaw has been lost in its transmission to England, probably at the Custom House. Another interesting circumstance is, that Mr. Annett corroborates Mr. Swinhoe's remarks as to the fecundity of this animal; he has constantly found five and six fœtuses in the doe when they have galled the deer, as is customary immediately after it is shot."

Professor Newton exhibited the humerus of a species of Pelican found during the past summer in Feltwell Fen, Norfolk, and presented to the Museum of Zoology at Cambridge by Mr. J. H.

* I was not aware, when these observations were made, that *Chironectes* occurs as far north as Costa Rica (see v. Frantzius in Wiegmann's Arch. 1869, i. p. 318).—P. L. S.

Gurney, jun., F.Z.S. Professor Newton remarked that though the present specimen was certainly adult, it did not bear out the observation of Professor Alphonse Milne-Edwards (*Annales des Sc. Nat. Zool. ser. 5, vol. viii. p. 285*) as to the larger size of the Pelican of the English Fens when compared with extant species, and exhibited in proof of this remark a humerus of a Pelican sent from Kustendji by Dr. Cullen, and believed to belong to *Pelecanus crispus*, as well as the humerus of the Fen-Pelican which had been shown to the Society on a former occasion (*P. Z. S. 1868, p. 2*), and which had been the subject of Professor Milne-Edwards's description.

The following papers were read :—

1. On the Freshwater Siluroids of India and Burmah. By Surgeon FRANCIS DAY, F.Z.S. & F.L.S., Inspector-General of Fisheries of British India.

[Received November 6, 1871.]

Having during the last few months been engaged in inspecting the fisheries of the Ganges, Jumna, and some of the tributaries of the Indus, I have drawn up the following sketch of the family *Siluridæ* as existing there, as well as of its ramifications towards the Malay archipelago. I have also received specimens of *Olyra* and *Akysis* collected by Mr. Kurtz from the hilly regions of Pegu, as well as two small but very interesting collections from Mr. Mundali from below Darjeeling, and a new form of *Hara* from a stream between Purneah and the Garrow hills.

I propose first to make remarks on species with reference to undescribed ones, corrections of identification, and the character of the air-vessel, with observations on the range of the genus; secondly, on their classification; and lastly, on their geographical distribution.

AKYSIS KURZII, sp. nov.

D. $\frac{1}{6}$ |0. P. $\frac{1}{7}$. V. 6. A. 11. C. 17.

Length of head nearly $\frac{1}{5}$, of caudal $\frac{2}{9}$, height of body $\frac{1}{8}$, of dorsal fin $\frac{1}{6}$ of the total length.

Eyes subcutaneous, situated at the commencement of the anterior two fifths of the head.

Lower jaw somewhat the longest, mouth terminal; nostrils some distance apart, with a barbel between them belonging to the posterior one. Barbels eight, slightly dilated at their bases, the maxillary extending to beyond the end of the pectoral fin, the external mandibular to opposite its middle, whilst the internal is as long as the head, as is also the nasal. Gill-openings wide, not confluent with the skin of the isthmus, and extending to opposite the middle of the opercle. Free portion of tail longer than high.

Teeth in a wide villiform band, none on the palate.

Fins. Dorsal situated entirely in advance of the ventrals, spine

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strong, two fifths as long as the head, and enveloped in skin. Pectorals horizontal. Adipose dorsal low, shorter than the rayed fin. Anal with its posterior rays longest. Caudal very deeply forked.

Skin smooth.

Lateral line present.

Air-vessel small, in the abdominal cavity, not enclosed in bone.

Colours. Uniform brown.

Hab. Pegue Yomas.

One specimen of this small species was collected in 1871 by S. Kurz, Esq., after whom I have named it. The genus extends to the Malay archipelago, but has not yet been recorded from India.

Genus HARA, Blyth.

Air-vessel rather large (*H. buchanani*) and situated in the abdomen, not enclosed in bone.

HARA ELONGATA, sp. nov.

D. $\frac{1}{6}$ | 0. P. $\frac{1}{6}$. V. 6. A. $\frac{2}{7}$. C. 17.

Length of head $\frac{1}{3}$, of caudal $\frac{1}{4}$, height of body $\frac{1}{7}$ of the total length, *Eyes* small, situated in the posterior half of the head.

Gill-opening narrow, extending from opposite the upper margin of the opercle to the thoracic surface, on to which, however, it is scarcely continued, but where its gill-membrane joins a very thick isthmus. No groove behind the chin. Barbels generic, maxillary ones reach the gill-opening. Occipital process three times as long as wide at its base; humeral process about half as long as the pectoral spine, and with one oval-shaped ossicle posterior to it. The process intermediate between the occipital and humeral ones is much longer than either, and rather deflected at its posterior extremity. Basal bone of dorsal fin very slightly dilated.

Fins. The base of the anal one half longer than that of the first dorsal, adipose fin short. Dorsal spine stout, laterally compressed, very strongly denticulated anteriorly, slightly so posteriorly; it is as long as the head. Pectoral spine one fourth longer than the dorsal, serrated on both edges, but most strongly so externally; the fin reaches the ventral, which last extends two thirds of the distance to the base of the anal. Caudal very deeply forked, the outer rays in both lobes being prolonged.

Skin covered with blunt spines, those on the body mostly directed backwards.

Lateral line as in *H. buchanani*.

Colours. Brownish, banded. Pectoral, ventrals, and anal yellow, each having a black band. Some black markings also on caudal and dorsal.

Hab. A stream near the Garrow hills.

One specimen $2\frac{1}{4}$ inches long. The genus appears to extend from the Kistna through Assam to Burmah, but has not been recorded further to the east.

Genus MACRONES, Duméril.

Pseudobagrus, Bleeker.

This genus possesses about twenty known representatives on the continent of India and in Burmah; but previously to describing some individuals I will give my reasons for considering *Pseudobagrus* a synonym of *Macrones*.

The genus *Macrones* includes species with less than twenty rays in the anal fin; *Pseudobagrus* those possessing twenty or upwards, the other differences being:—in the first the dorsal fin has one spine and seven rays; in the second, one spine and from five to seven rays.

If we examine the species, we see amongst them the following:—*Macrones keletius*, A. 9; *M. leucophasis*, A. 10; *M. cavasius*, A. 11; *M. carcio*, A. 12–13; *M. tengana*, A. 14; *M. batasio*, A. 16; whilst the *Pseudobagrus aurantiacus* has A. 20–22; *P. vachellii*, A. 23–24; *P. chryseus*, A. 27,—thus showing a regular gradation.

The subgenera, or those with a separate interneural shield on the nape and those destitute of such, appear, at least sometimes, to denote other internal structural differences in those which I have examined. Amongst the former are *M. aor* and *M. lamarii*, in which the anterior portion of the air-vessel is attached to the under surface of the bodies and expanded processes of the anterior vertebræ, but its posterior extremity is elongated and pyriform; internally it has a longitudinal septum.

On the contrary, in those not having this separate shield, the posterior extremity of the air-vessel is not elongated, the longitudinal septum (as in all those of this genus which I have examined) has a communicating opening anteriorly; and sometimes there are transverse partitions forming chambers, which freely communicate with those on the same, and by means of the anterior one with those on the opposite side, as in *M. cavasius*, *M. tengana*, *M. carcio*.

Amongst the species of this genus are several but slightly known, and others which I believe have been erroneously identified.

MACRONES CARCIO, H. B. pl. 23. f. 60.

D. $\frac{1}{7}$ |0. P. $\frac{1}{9}$. V. 6. A. $\frac{2-3}{9-10}$. C. 19.

The figure in the 'Gangetic Fishes' marked *Pimelodus batasius* belongs to this species. In Hamilton Buchanan's MS. drawings* is a figure of the latter $3\frac{2}{10}$ inches long, showing, as he observes in the text, that none of the barbels are as long as the head.

Groove on the summit of the head extends to midway between the posterior edge of the orbit and the base of the occipital process.

Fins. Dorsal spine slightly serrated anteriorly in its upper third and also along the whole of its posterior surface, its length being equal to half that of the head; the adipose fin commences some distance behind the first dorsal, and the extent of its base is from

* Concerning identifications of Hamilton Buchanan's MS. drawings and the British-Museum Catalogue, see article in the 'Proceedings of the Asiatic Society of Bengal,' September 1871.

one third to one half more than that of the base of the first dorsal. Pectoral spine as long as the head without the snout, and armed internally with about fifteen strong teeth.

Air-vessel large, heart-shaped, divided internally into two lateral cavities by a fibrous partition, which, however, possesses a large oval opening anteriorly, thus permitting a free communication between the two chambers.

The species is fully described in the 'Catalogue of Fishes of the British Museum' (vol. v. p. 81) under the name of *Macrones tengara*.

MACRONES TENGARA, H. B. pl. 3. f. 61.

D. $\frac{1}{7}$ |0. P. $\frac{1}{8}$. V. 6. A. $\frac{3}{7}$. C. 19.

Length of head $\frac{1}{5}$, of caudal $\frac{1}{5}$, height of body $\frac{1}{5}$ of the total length.

Eyes. Diameter $\frac{2}{9}$ of length of head, $1\frac{1}{2}$ diameter from end of snout and apart.

Groove on the summit of the head extends to the base of the occipital process, which latter is roughened in lines, and about two fifths as wide as long. Nasal barbels half as long as the head, the maxillary reach the base of the caudal fin, the external mandibular the middle of the pectoral, whilst the internal are shorter.

Fins. Dorsal spine weak, nearly half as long as the head, and smooth on both edges; adipose fin (as is well shown in the figure) commences just behind the base of the first dorsal, as which it is nearly three times as long. Pectoral spine as long as the head to the middle of the eye; it has about ten moderate-sized teeth internally, and is finely serrated externally. Caudal lobed, the upper the longer.

Colours. Brownish yellow, with three longitudinal broad brown bands, and a black blotch on the shoulder.

MACRONES VITTATUS, Bl.

Bagrus oculatus, Cuv. et Val.

Bagrus montanus &c., Jerdon.

Macrones armatus, Day.

Hab. Madras Presidency, Mysore, and the western coast of India.

MACRONES GULIO, H. B. pl. 23. f. 66.

Air-vessel large, heart-shaped, having a longitudinal septum internally, which has a connecting opening in its fore part. The lateral compartments are subdivided by transverse partitions, which communicate with those of the same side.

MACRONES MENODA, H. B. pl. 1. f. 72.

Bagrus trachucanthus, Cuv. et Val.

Hab. Large rivers of Bengal, Orissa, and Burmah.

MACRONES TENGANA, H. Buch., Fishes of Ganges, pp. 176, 377, pl. 39. f. 58.

B. vi. D. $\frac{1}{7}$ |0. P. $\frac{1}{8}$. V. 6. A. $\frac{4}{10}$. C. 15.

Length of head $\frac{1}{4}$, of caudal $\frac{1}{4}$, height of body $\frac{1}{4}$ of the total length.

Eyes of moderate size, situated nearer the snout than the posterior half of the head.

Width of head equals its height, and is as long as the head without the snout. Groove on the summit of the head lanceolate in its posterior half and extending to the base of the occipital process, which is twice as long as wide at its base, and reaches the basal bone, which is V-shaped. Nasal barbels extend to the posterior margin of the orbit, the maxillary to the middle or end of the pectoral fin, the external mandibular are as long as the head, the internal shorter.

Teeth in an uninterrupted crescentic band on the palate.

Fins. Dorsal spine smooth, as long as the head without the snout, whilst the fin is as high as the body below it; adipose fin small, its base shorter than that of the first dorsal. Pectoral spine as long as the head without the snout; it is strongly serrated internally. Caudal deeply lobed, the upper slightly the longest.

Colours. Golden, with three or four longitudinal bands formed of black spots in the upper one along the back, and black stars in the lower ones. A darkish blotch formed of spots over the base of the pectoral fin; some spots on the dorsal and the margins of the other fins stained.

Hab. Assam and the Punjaub; attaining about 3 inches in length.

Hamilton Buchanan observes, all the barbels are shorter than the head; but my specimens so exactly resemble his figure and description, except in the maxillary barbels being longer (and they varied in individuals), that I consider they must be the same. I took upwards of twenty in a tank near Goordaspoor in the Punjaub.

This genus, containing mostly only inhabitants of fresh waters, still has estuary or marine representatives (*M. gulio*, H. B.). It is found generally throughout India and Burmah, down to the Malay archipelago.

rita crucigera, Owen.

Pimelodus rita, Ham. Buch. pl. 24. f. 53.

I have found this species throughout the extent of the Ganges and Jumna, and also in the Punjaub rivers; but it is subject to considerable variation, due to age and locality. The dorsal spine may be as long as, or longer than, the head, the pectoral being somewhat shorter, whilst the humeral process, although not pointed, is but very slightly rounded.

Air-vessel with a thick outer coat and thin lining membrane. Its external form is somewhat quadrangular; and posteriorly it is continued into two horn-like processes, nearly or as long as the abdominal cavity; the right one usually passing over to the left side and curving across the commencement of the left one, whilst the left one first passes downwards and then is sometimes recurved on itself. On the front wall being removed a longitudinal median partition is seen in its posterior half, dividing it into two large smooth cavities, which anteriorly communicate, and are continued posteriorly down the horn-like or tubular processes.

This genus extends throughout the larger rivers of India and

the Punjab and Burmah. *Arius manillensis*, Cuv. et Val., may, however, belong to the genus, although, as its specific name implies, it is stated to have come from Manilla.

Genus ARIUS.

In the species of this genus which I have examined the air-vessel is enclosed in bone; but a short time since the following remark by Dr. Taylor of Dacca, published in the 'Gleanings in Science' (vol. ii. 1830), made me desirous to obtain *A. gagora* before I completed this paper; this I have now accomplished. Dr. Taylor observes, "in the *Pimelodus gagora* there are two air-vessels, lodged one on each side in an osseous cup, attached by a narrow neck to the body of the first vertebra, close to its junction with the cranium." He goes on to describe what he found; but it could not have been in *Arius gagora*, H. B. In Owen's 'Comparative Anatomy' (vol. i. p. 491) it is stated of the air-bladder of fishes that it is "seldom divided lengthwise into two bladders (*Arius gagora*, *Polypterus*, *Lepidosiren*, fig. 324)."

ARIUS GAGORA, Ham. Buch. pl. 10. f. 54.

Air-vessel large and somewhat heart-shaped, with a moderately thick external fibrous coat. On removing its front wall a longitudinal partition becomes apparent, but is not extended to its anterior portion. It has three transverse subdivisions, forming it into five cavities, owing to the longitudinal partition commencing at the first transverse subdivision. These lateral cavities freely communicate with one another on the same side, and with the opposite ones by means of the anterior chamber, which does not possess any subdivision.

This is the only species of the genus which I have found in fresh water high up rivers, having taken it at Mandalay in Native Burmah, about 650 miles from the sea.

ARIUS JATIUS.

Pimelodus jatus, H. B.

Amongst many specimens that I have obtained in Calcutta this year the anal rays were nineteen or twenty; and I can indorse Hamilton Buchanan's and Mr. Blyth's observations as to the difficulty of seeing the granular palatine teeth. I believe, from the description, that *A. macracanthus*, Günther, reputed to have been obtained from Siam, is this species.

ARIUS SONA.

Pimelodus sona, H. B., appears to be the *Bagrus gagorides*, Cuv. et Val.

ARIUS NENGA.

Pimelodus nenga, H. B. (MS. figure), appears to be the *Bagrus arioides*, Cuv. et Val.

The genus *Arius* is found throughout the seas and estuaries of India, Ceylon, Burmah, the Andaman and Nicobar Islands; it also extends to most of the tropical regions. In India it is strictly marine, but enters rivers often to a long distance from their mouths. Whether it breeds in the fresh waters is questionable.

OSTEOGENIOSUS VALENCIENNESII, Bleeker.

In a specimen from Moulmein, taken in the river, the air-vessel was large, heart-shaped, having an internal longitudinal septum, and not enclosed in bone.

Geographical distribution.—A marine genus, extending through the seas of India to the Malay archipelago. Some enter the mouths of rivers.

PANGASIUS BUCHANANI, Cuv. et Val.

Pimelodus pangasius, H. B. pl. 33. f. 52.

Air-vessel large, extensive, and divided into three portions. The anterior is somewhat heart-shaped, considerably the largest, and extends from the commencement of the vertebral column to nearly opposite the posterior extremity of the pectoral fin. Its remaining portions are narrow, compressed, and continued to opposite the middle of the anal fin, amongst the muscles covering the hæmal spines. It then becomes narrow and reduplicated on itself for a short distance. On removing the front wall of its first or largest portion, its interior is seen to consist of two pear-shaped cavities, the bases of which are inferior and lateral, whilst they coalesce anteriorly; the whole of the posterior half of this portion is cellular; and so is the small intermediate space between the two uncalled pyriform portions. The two posterior divisions of the air-vessel have valvular-shaped folds partially subdividing its interior.

Geographical distribution.—The Indian species is found within tidal influence, as well as inland in the larger rivers far beyond the tides. The genus extends through Burmah to the Malay archipelago.

Genus *PSEUDEUTROPIUS*, Bleeker.

Schilbichthys, sp., Bleeker.

Air-vessel in *P. garua*, H. B., small and somewhat heart-shaped, it is closely attached to the bodies of the anterior vertebræ; its external fibrous covering is of moderate strength. In *P. atherinoides*, Bloch, it is of a large size, as wide as the abdominal cavity, and on removing its front wall a longitudinal septum is seen dividing it into lateral portions, which, however, communicate anteriorly. In some there is a further subdivision in its posterior portion. In some of the larger species (as *P. murius*, H. B., and *P. goongwaree*, Sykes) the air-vessel is larger than in *P. garua*, and comparatively considerably smaller than in *P. atherinoides*, Bloch. *P. garua*, in which the adipose dorsal is so small, and altogether absorbed in the adult,

has the smallest air-vessel amongst the larger species which I have examined.

The genus extends throughout India and Burmah.

CALLICHOUS EGERTONII, sp. nov.

Palloo, Punj.

D. 4. P. $\frac{1}{12}$. V. 8. A. 52-54. C. 17.

Length of head about $\frac{1}{5}$ ($\frac{4}{21}$), of caudal $\frac{1}{8}$, height of body $\frac{1}{5}$ of the total length.

Eyes. Diameter $\frac{1}{6}$ of length of head, 2 diameters from end of snout.

Snout obtuse, rounded; lower jaw strongly prominent. Maxillary barbels extend a little beyond the base of the pectoral fin, the mandibular pair are nearly half as long as the head.

Teeth vomerine, in two separate patches.

Fins. Dorsal very narrow; pectorals rounded, rather longer than the head without the snout, its spine moderately strong, nearly as long as the postorbital portion of the head, and strongly denticulated internally; anal terminating close to the caudal, but separated from it; the latter fin forked in its posterior half, its upper lobe the longest.

Colours. Olive, shot with purple and gold, its body and fins covered with blotches of a brownish colour; a large black finger-mark over the posterior half of the pectoral spine.

Hab. Subhimalayan range in the Punjaub.

I have named the species after the Hon. R. Egerton, from whom I have received great assistance in my investigations.

Geographical distribution.—This genus extends throughout India and Burmah to the Malay archipelago. The distinctions between *Cryptopterus*, Bleeker, in the extended sense as accepted by Dr. Günther, and *Callichrous* seem to show the advisability of separating them into distinct genera.

Genus WALLAGO, Bleeker.

Air-vessel of moderate size, situated in the anterior part of the abdomen; on removing its front wall it is found to be divided into two lateral chambers by a longitudinal septum, which, however, has a rounded orifice anteriorly, so as to admit of free communication between the two sides.

Geographical distribution.—India, Burmah, and the Malay archipelago.

Genus OLYRA, M'Clelland.

Dorsal profile nearly horizontal, neck not elevated. Body low and elongate. Head depressed, superiorly covered with soft skin. Mouth terminal, transverse; jaws about equal in length, or the lower the longest. Nostrils remote from one another, the posterior provided with a barbel. Gill-openings wide, the membrane not confluent with that of the isthmus. Barbels eight. Eyes small, subcutaneous. Villiform teeth on the jaws and palate. First dorsal fin without a

spine, and having six to eight rays; adipose dorsal long and low; anal of moderate length (fifteen to twenty-three rays); ventral inserted below the dorsal, and having six rays. Caudal rounded or lanceolate. Air-vessel not enclosed in bone. Skin smooth.

OLYRA BURMANICA, sp. nov.

D. 8|0. P. $\frac{1}{4}$. V. 6. A. 16. C. 17.

Length of head $\frac{2}{15}$, of caudal $\frac{1}{3}$, height of body $\frac{1}{15}$, of dorsal fin $\frac{2}{15}$ of the total length.

Jaws of nearly equal length; head depressed; opercles rather pointed. Eight barbels, without dilated bases, of which the maxillary are the longest, almost reaching the base of the ventral fin; the external mandibular are as long as the head. Nostrils patent, wide apart, the posterior provided with a barbel, the anterior just over the snout but not in front of it. Gill-openings wide, the membrane not confluent with the isthmus, and extending laterally to opposite the point of the opercle.

Teeth villiform in both jaws, the outer row slightly the largest. An uninterrupted horseshoe-shaped band across the palate.

Lateral line present. Skin smooth.

Air-vessel large, thin, and not enclosed by bone.

Fins. Dorsal without any osseous ray, its first the shortest, the fin commences opposite the ventrals; adipose dorsal very long and low. Pectoral spine rather strong, slightly serrated externally, coarsely so internally; the fin only extends halfway to the ventral. The anal rays increase in length to the last. Caudal with its central rays strongest and elongated, making the fin one third of the total length.

Colours. Dark brown.

Hab. Pegue Yomas.

I am indebted to S. Kurz, Esq., for two specimens, collected by him in 1871.

Geographical distribution.—Khasya hills, where M'Clelland obtained *O. longicaudata* and *O. laticeps*, to the Pegue hills.

SILURUS COCHINCHINENSIS, Cuv. et Val.

Air-vessel in the abdominal cavity, not enclosed in bone.

Geographical distribution.—Besides the specimen recorded by Blyth from Burmah, and the one I obtained from near Akyab, I have now received two more from below Darjeeling collected by Mr. Mundali. This species consequently extends from near Darjeeling, in the Subhimalayan range, to Cochin China, perhaps being confined to the vicinity of hills. The genus, however, has a much wider range,—one species existing in the Wynaad Hills on the Malabar coast; another is recorded from Afghanistan; and it extends into Europe, where the *S. glanis* exists. The genus *Silurichthys* is distributed from Cashmere to the Malay archipelago and China; and the distinctions between the two genera, as at present defined, appear to be but slight.

PLOTOSUS CANIUS, H. B. pl. 15. f. 44.

Air-vessel of moderate size, placed transversely across the anterior vertebræ. Its external fibrous coat is thick, whilst internally it is divided by a longitudinal septum into two lateral cavities, which communicate anteriorly by a large circular opening.

Geographical distribution.—This genus contains marine and estuary fishes; but *P. canius* is sometimes captured in fresh water. The genus has a very extensive range, being found in Africa, Asia, through the Indian seas to the Malay archipelago, and even beyond it.

CLARIAS MAGUR, H. B. pl. 26. f. 45.

Air-vessel tubular, placed transversely across the body of the anterior vertebræ, where it is entirely enclosed in a bony capsule. This subject is remarked upon in Cuv. and Val.

Geographical distribution.—The genus is found in Africa, India, Ceylon, Burmah, throughout the Malay archipelago, even to beyond it.

SACCOBRANCHUS FOSSILIS, Bl.*Silurus singio*, H. B. pl. 37. f. 46.

Air-vessel small and situated transversely across the body of the anterior vertebræ, either extremity being enlarged, globular, and enclosed in a bony capsule. Cuv. and Val. remark upon this.

Geographical distribution.—The genus extends through India, Ceylon, Burmah, and, according to Dr. Günther, Cochin China.

SILUNDIA GANGETICA, Cuv. et Val.*Pimelodus silondia*, H. B. pl. 7. f. 50.

Air-vessel small and placed transversely across the body of the anterior vertebræ, where there is a groove to receive its posterior surface; anteriorly it has a thick, strong, fibrous covering. There is a low osseous process from the vertebra, giving it protection laterally. The air-vessel itself consists of two small oval portions, having a median connecting tube; and this lateral part is surrounded by osseous or strong fibrous walls.

Geographical distribution.—Large rivers of India and Burmah.

AILIA BENGALIENSIS, Gray.

Air-vessel as in the following genus.

Geographical distribution.—Rivers of the plains of India (except in Madras), extending to the upper portions of the Ganges and Jumna, but not on to the hills; also Assam.

Genus *AILIICHTHYS*, gen. nov.

Differing from *Ailia* in that the ventral fins are entirely absent.

Geographical distribution.—The Jumna, and southern rivers in the Punjab that are tributaries of the Indus, but not those on the hills.

AILIICHTHYS PUNCTATA, sp. nov.P. $\frac{1}{12}$. A. 76-82. C. 17.Length of head $\frac{1}{7}$, of caudal $\frac{1}{6}$, height of body $\frac{2}{11}$ of the total length.*Eyes* situated more than half below the angle of the mouth, being partly on the lower side of the head. Diameter $\frac{1}{3}$ of length of head, $\frac{1}{2}$ a diameter from end of snout, 1 diameter apart.

Body compressed, upper profile of head somewhat concave.

Upper jaw slightly the longest, the cleft of the mouth only extending about halfway to the anterior margin of the eye, opposite to its centre. Barbels all much of the same length, reaching to the middle of the length of the fish.

Teeth villiform in the jaws.*Fins*. Adipose dorsal minute. Pectoral spine one half longer than the head. Ventrals absent. Caudal forked, lower lobe the longest.

Air-vessel tubular, placed across the bodies of the anterior vertebrae, and more or less enclosed in bone.

Colours. Silvery, upper surface of head nearly black, a large black spot before the base of the caudal fin.*Hab*. Jumna at and below Delhi, also in the Lower Punjab rivers. It is rather numerous, apparently more common in the Punjab than the *A. bengaliensis*. I obtained numerous specimens up to 4 inches in length.*EUTROPIICHTHYS VACHA*, H. B. pl. 19. f. 64.

Air-vessel narrow, tubiform, placed transversely across the body of the anterior vertebrae, and all but its central portion enclosed in bone, either expanded extremity being within a bony capsule.

Geographical distribution.—Large rivers of India and Burmah. It appears to prefer estuaries and the lower portion of rivers.Genus *SISOR*, H. B.

Air-vessel. Having only small specimens to dissect, a further examination of this species is desirable. Subvertebral bony capsules were present, and apparently contained an air-vessel, whilst none could be detected in the abdomen.

Geographical distribution.—Ganges and Jumna rivers.Genus *GAGATA*, Bleeker.*PIMELODUS GAGATA*, H. B. pl. 39. f. 65.

Air-vessel in two globular portions, enclosed in bony capsules, placed on either side of the body of the anterior vertebrae, and having a transverse communicating tube.

Geographical distribution.—Large rivers of India and Burmah, and generally not far from their mouths.Genus *HEMIPIMELODUS*, Bleeker.In both *H. cenia*, H. B., and *H. viridescens*, H. B., the air-vessel

is placed transversely across the body of the anterior vertebræ. It has an expanded globular portion on either side enclosed in a bony capsule, and with a transverse connecting tube.

Geographical distribution.—Central India, Jumna, and Ganges, and through Burmah to the Malay archipelago.

Genus BAGARIUS, Cuv. et Val.

Air-vessel small, consisting of two round portions situated on either side of the body of the anterior vertebræ and partially enclosed in bone. (For a detailed description, see Taylor in 'Gleanings in Science,' 1830.)

Geographical distribution.—Throughout the large rivers of India.

Genus PSEUDECHENEIS, Blyth.

Air-vessel in two rounded lateral portions, each of which is enclosed in a bony capsule.

Geographical distribution.—The Subhimalayas below Darjeeling, and on the opposite side of the Brahmaputra, on or near the Khasya hills.

Genus GLYPTOSTERNUM, M'Clelland.

Air-vessel in two rounded lateral portions and enclosed in bony capsules.

GLYPTOSTERNUM STRIATUM, M'Clelland.

I have obtained this species with from nine to eleven anal rays, and I suspect *G. reticulatus* and *G. pectinopterum*, M'Clell., to be synonyms. It is found in the rivers of the lower plateau of the Himalayas, down to those of the plains; and a most remarkable difference is perceptible in specimens from these two situations. Only small ones are taken on the hills; and these have the pectoral and ventral rays plaited inferiorly, more especially in the young, evidently to enable them to adhere to the rocks, and by these means, with the assistance of the adhesive sucker on the chest, to withstand the impetuosity of the mountain-torrents. I took larger ones in the Beas near the plains; and in them this plaiting was either very indistinct or entirely absent, whilst there cannot be a doubt as to the identity of the species.

GLYPTOSTERNUM DEKKANENSE, Günther.

I found this species tolerably abundant in the Jumna, near where it emerges from the Sewalik hills.

GLYPTOSTERNUM MODESTUM, sp. nov.

D. $\frac{1}{6}$ | 0. P. $\frac{1}{8}$. V. 6. A. $\frac{2}{7}$. C. 15.

Length of head $\frac{1}{5}$, of caudal $\frac{2}{11}$, height of body $\frac{2}{13}$ of the total length.

Eyes small, superior, situated in the middle of the length of the head.

Head as broad as long, depressed, covered with skin. Snout broad. Caudal peduncle two thirds as high as long. Thoracic adhesive apparatus small. Gill-membranes generic. Lips not fringed. Maxillary barbels with broad bases, and nearly as long as the head, the nasal reaching halfway to the orbit, the external mandibular pair longer than the internal. Occipital process slightly longer than it is broad at its base.

Fins. Dorsal nearly as high as the body, its spine half as long as the head and enveloped in skin; adipose dorsal rather low, its base slightly longer than that of the first dorsal. Pectoral spine broad, reaching two thirds of the distance to the base of the ventral, not plaited inferiorly, whilst externally it is smooth, and internally has seven strong denticulations; it is two thirds as long as the head. Caudal forked, lower lobe slightly the longer.

Skin smooth. Air-vessel generic.

Colours. Uniform brown.

Hab. Numerous specimens up to 3 inches long from the upper portion of the Jumna.

Geographical distribution.—Throughout India (? Madras), Burmah, to the Malay archipelago. Some species when small appear to be found in mountain-streams.

Genus EXOSTOMA, Blyth.

Air-vessel in a globular form on either side of the body of the anterior vertebræ, and enclosed in bone.

EXOSTOMA BLYTHII, Day, Proc. Zool. Soc. 1869, p. 525.

D. $\frac{1}{6}$ | 0. P. $\frac{1}{17}$. V. 6. A. $\frac{2}{5}$. C. 13.

An erratum occurred in the original description in the number of anal rays, which are seven, the two first of which are undivided.

Having been favoured by Mr. Mundali and Dr. Stoliczka with several specimens up to $3\frac{2}{10}$ inches in length, I find its habitat to be the rivers below Darjeeling.

In some of the larger specimens the caudal fin is not lobed, but its outer rays are rather elongated, whilst all the intermediate ones are of the same length.

Geographical distribution.—This genus, so far as I have been enabled to trace its species, commences in the rivers below Darjeeling (*E. blythii*); it is then found in the Mishnee mountains in Assam (*E. labiatum*); more to the east it has its representatives in Tenasserim (*E. berdmorei*); whilst specimens were brought by the expedition which went through Upper Burmah to China (*E. andersonii*).

The systematic arrangement of the family *Siluridæ* has always been found intricate, judging from the constant changes to which it has been subjected. Although I have no new system to propose, I would draw attention to some points respecting those genera which inhabit the waters of India, which seem to show that further altera-

tions will be necessary, by all who consider a natural arrangement preferable to an artificial one.

During the past year I have examined as many Indian Siluroids as I have been able to obtain in order to discover the character of their air-vessels*—a subject which was commenced by Dr. Taylor of Dacca in the 'Gleanings of Science' (vol. ii. 1830), a paper which I only obtained for the first time in September 1871. Cuv. and Val. have also some remarks on the air-vessels of *Saccobranchus* and *Clarias*.

Having in 1869, whilst in Orissa, discovered that the air-vessel of *Gagata typus*, Bleeker, possessed a bony capsule, and since then that several other Siluroids had this organ similarly protected, I proposed to obtain, if possible, species of every Indian genus, in order to institute a general examination of those of the family.

The *Cyprinidæ* of India are divisible into three subfamilies, one of the chief characteristics of which are:—first, the air-vessel free in the abdominal cavity, elongated, and with a transverse constriction (*Cyprinina*); or divided into two lateral portions, partially or entirely enclosed in a bony capsule (*Cobitidina*); or absent (*Homaopterina*). From the opportunity I have had of obtaining specimens of all the Indian freshwater genera, excepting *Chaca*, I have now been enabled to ascertain the position and shape of this organ in the *Siluridæ*.

A far wider acquaintance with all the known genera of this family is desirable before any definite conclusions can be arrived at; but sufficient materials exist in India to show that the present arrangement can hardly be continued.

In the Indian freshwater Siluroids (and for the sake of rendering this paper more complete I include those marine genera which ascend rivers for the purpose of obtaining food) there are two distinct divisions of air-vessels—those which are not enclosed in bone, and those which are.

Of those with the air-vessel not enclosed in bone we have *Akysis*, *Hara*, *Macrones*, *Rita*, *Arius*, *Batrachocephalus*, *Osteogeniosus*,

* This subject appears, if one may form an opinion from the British Museum Catalogue, to have escaped Dr. Günther's attention. In vol. v., 277 pages are filled with an account of the family *Siluridæ* and the species composing it; but I only observe the air-vessel alluded to four times, as regards the Siluroids of India or the Malay archipelago:—first, that if present in the order Physostomi, it has a pneumatic duct (p. 1); secondly, that it is generally present in the family *Siluridæ*, communicating with the organs of hearing and by means of the auditory ossicles (p. 2); whilst at p. 38, in the definition of the genus *Cryptopterus*, it is observed, "air-bladder transparent through the sides of the body;" and at p. 40, of *C. limpok*, "this species appears to have the place behind the head, where the air-bladder is seen through the transparent skin, of a dark colour during life." I allude to the above in full to obviate the possibility of its being supposed that I wish to create any erroneous impressions respecting Dr. Günther's valuable ichthyological writings (see Zool. Record for 1869). Nothing is further from my wish, which is to obtain *facts*, no matter who the author may be, and, if possible, to take nothing on trust from any naturalist, however excellent an observer he is, when I can examine into the matter myself.

Pangasius, *Pseudeutropius*, *Callichrous*, *Wallago*, *Olyra*, *Silurus*, *Plotosus*, whilst *Chaca* is at present doubtful. The general form of the air-vessels is elongated, or heart-shaped, some being posteriorly prolonged. Internally there is an internal septum dividing the organ into two lateral halves, which are sometimes further subdivided by transverse partitions. The central longitudinal septum has an orifice anteriorly affording communication with the two sides; whilst all the lateral chambers communicate with one another on the same, and by means of the anterior one with those on the opposite side.

Of those with the air-vessel wholly or partially enclosed in bone, we have *Clarias*, *Saccobranchus*, *Silundia*, *Ailia*, *Ailichthys*, *Eutropiichthys*, *Sisor*, *Gagata*, *Hemipimelodus*, *Bagarius*, *Pseudecheneis*, *Glyptosternum*, *Amblyceps*, and *Exostoma*. The general form of these air-vessels is transverse, with the outer extremities usually dilated and enclosed in bone. Or the air-vessel may be in the form of two rounded lobes enclosed in bone, with a connecting tube, or else the pneumatic ducts coalesce a short distance before they enter the pharynx or upper portion of the alimentary canal.

This last division has much in it that is Loach-like in its smaller forms; and Mr. Blyth's observation of *Amblyceps*, a "*Cobitis*-like Siluroid," is still further apparent when we examine its air-vessel. Thus it gradually leads the Siluroids towards the *Cobitidina*.

I do not propose at present to enter further upon the subdivision of the Siluroids, as I hope those who have the opportunity of giving descriptions of the air-vessels of extra-Indian genera will do so, in order to ascertain whether this division is a natural one and applicable to the whole of the family*, as I anticipate it will be found to be.

The following notes upon the geographical distribution of these fishes are far from complete; but I deem it advisable to give them as they are, for were I to wait until all that is desirable is effected, I fear the paper would never be finished.

Previously to commencing the geographical distribution of the *Siluridæ*, I have some remarks to offer respecting the limits chosen and the terms employed.

By *India* or *Hindoostan* I understand the whole of the continent under British rule or protection, or independent native states when surrounded by British territory. *Burmah* includes Arracan and the Tenasserim provinces, whilst the designation *Ceylon* answers for itself.

The *East-Indian archipelago* has been commonly employed in zoology to express in a general way a large space variously limited or expanded by each fresh author, and is scarcely sufficiently defined when entering upon the distribution of freshwater genera or species of fish. I shall therefore employ Wallace's definition of the *Malay*

* Any naturalist who wishes to exchange Tropical forms of Siluroids, personally collected, for those from Hindoostan, will always find me ready to meet his views. The reason why I wish them personally collected is that the localities may be correctly appended.

archipelago, down to which point my investigations have more or less been carried on. His limits of this archipelago, lying between Asia and Australia, extend from the Nicobars and the Tenasserim provinces on the west, to the Philippines on the east, thus forming its northern boundary; whilst the Solomon Islands beyond New Guinea define it on the east. This space he subdivides into five groups, which, for my purpose, it is unnecessary to enumerate.

My collections were made in Malabar, Madras, Orissa, and Lower Bengal, up the valley of the Ganges, in the North-West Provinces and the Punjab, and through Burmah to as far as Mergui in Tenasserim. In this wide extent of country many fishes have doubtless escaped my observation; still I have obtained at least a general insight into their distribution. The facts recorded by Hamilton Buchanan, M'Clelland, Sykes, Blyth, and Jerdon are valuable, as either increasing one's knowledge of localities or verifying personal observations; some references, which I am doubtful about, I am compelled to omit, as when the author is not so accurate in his geography as is desirable for investigations of this description.

Siluroids inhabit all fresh waters in India and Burmah—some almost generally, others locally. For an explanation of this I must give a short description of these localities, especially with reference to their ichthyology. These pieces of water consist of rivers, lakes, or tanks, and jheels or swamps.

The rivers may be arbitrarily divided into three portions, viz.:—those existing in mountainous districts; secondly, from such to within tidal influence; and, lastly, the tidal portions. As certain visible results exist due to these three various localities, it will be necessary to explain what their local causes are.

The hill-rivers, or rather those which take their rise in hill-ranges, consist of two very distinct classes, namely those which have and those which have not alpine sources. Generally speaking, *the rivers which possess alpine sources*, as those which descend from the Himalayas, are chiefly replenished by the melting of snow at their origius during the hot months of the year, consequently a diurnal rise and fall in them is apparent, corresponding to the distance from their snowy sources. During the monsoon or rainy season, doubtless the rains also assist in the melting of the snow, exclusive of which, however, they are sufficient to fill the rivers in a spasmodic manner. They thus form torrents, rapidly rising and as rapidly subsiding. During the cold season, unreplenished by rains or melting snows, they dwindle down to a small size. Of the fish inhabiting these places, some of the Siluroids possess suckers or adhesive organs on their heads or chests, as is also perceived in the genera *Disco-gnathus* and *Oreinus* amongst the Carps. By means of these suckers they retain their hold against rocks and thus prevent themselves from being washed away.

In the *rivers destitute of alpine sources*, as those of the Neilgherries and the Wynaad in Madras, where snow but rarely falls and never remains for months, we have a different state of affairs. Amongst these must be classed the substreams or affluents of the

larger snow-fed rivers; and it is in these places that all the hill-fishes breed (if we except the Loaches).

The *rivers of the plains* are of course merely the continuations of those descending from the hills; but the daily rise from melted snows becomes less and less apparent the further we go from their snowy sources. They may be divided into two classes: in the first, as the Indus, Irrawaddy, &c., a fair supply of water is always present; the second class, as the Soane or the Cauvery, become nearly dry during the hot weather—this result of course being mainly due to their being replenished or not by melting snows.

The Siluroids are very extensively distributed in India and Burmah, where they appear to delight in muddy water, avoiding that which is clear, especially if it has a stony or gravelly bed. Some which are marine are only temporary visitors to the fresh waters, whilst others live entirely in fresh water; a few appear to live in estuaries, sometimes ascending the rivers, at others extending their range along the sea-coast, as necessitated by the abundance or absence of food.

A few small species always reside in the streams of mountains or in those flowing near their bases, whilst the larger forms prefer the rivers of the plains. Some inhabit tanks only; others prefer running water; whilst a few are common to both. Some of these fishes aestivate during the hot months of the year.

Cold does not appear to suit Siluroids, the number of genera and the species rapidly decreasing as cold climates are approached. Attempting to introduce some on to the Neilgherries a few years since, they perished on the journey and apparently from cold. All of these belonged to the division having the air-vessel not enclosed in bone. But this cannot be assumed as the reason; for I received two species belonging to this group from the Pegu hills (*Akysis* and *Olyra*), whilst I have also obtained *Silurus punctatus* from an elevation of 2500 feet in the Wynaad; in none of these situations, however, were the rivers snow-fed.

The Siluroid forms which I have collected from the snow-fed Himalaya rivers or those streams in the Subhimalayan range all belong to the division with the air-vessel small and enclosed in a bony capsule, as *Pseudecheneis*, *Glyptosternum*, *Amblyceps*, and *Exostoma*. There are, however, many other genera of this group which are not found on the hills.

Countries possessing large and muddy rivers in their plains, such as Burmah, are more suited for Siluroids than such localities as Madras, where the rivers are smaller, the waters clearer, and the beds more stony. When investigating the fish-fauna of large tracts of country this becomes very evident: thus at Hurdwar, near where the river Ganges debouches into the plains, the large Ganges canal commences; both the bed of the river and that of the canal are stony, the waters pretty clear, and Siluroids are rare. Near Dheeri and in the Soane river, which has a pebbly bed, it is exceedingly clear water when floods are absent; but few Siluroids are found there, and these mostly the little *Macrones carcio*, H. B. A few miles

distant is the narrower, sluggish, but deeper and muddy Poon river, where Siluroids abound.

If we now examine the foregoing twenty-eight genera of Indian Siluridæ, fourteen will be found to have the air-vessel free in the abdominal cavity, and the remaining fourteen to have it more or less enclosed in bone. For facility of description I will divide them thus:—

1. *Air-vessel free in the Abdominal Cavity.*

Genera restricted to India, none; extending also into Burmah, (1) *Rita*, (2) *Hara*, (3) *Pseudeutropius*, and (4) *Silurus*; found in an intermediate hilly district*, (5) *Olyra*; restricted to Burmah, none; common to it and the Malay archipelago, (6) *Akysis*; found in India, Burmah, and the Malay archipelago, (7) *Macrones*, (8) *Callichrous*, (9) *Wallago*, (10) *Arius*, (11) *Osteogeniosus*, (12) *Batrachocephalus*, (13) *Pangasius*, and (14) *Plotosus*. As, however, (10), (11), (12), and (14) are, strictly speaking, marine, only entering rivers for predaceous purposes, I shall omit them, thus reducing the total to ten.

2. *Air-vessel more or less enclosed in Bone.*

Genera restricted to India, (1) *Ailia*, (2) *Ailiichthys*, (3) *Sisor*, (4) *Bagarius*, and (5) *Amblyceps*; extending also into Burmah, (6) *Saccobranchus*, (7) *Silundia*, (8) *Eutropiichthys*, and (9) *Gagata*; found in an intermediate hilly district, (10) *Pseudecheneis*; also extending into Burmah, (11) *Exostoma*; restricted to Burmah or peculiar to it and the Malay archipelago, none; found in India, Burmah, and the archipelago, (12) *Clarias*, (13) *Hemipimelodus*, and (14) *Glyptosternum*, which last, however, only appears to have one representative in the Malay archipelago.

Out of the foregoing twenty-four genera as restricted, seven only appear to extend from India throughout to the Malay archipelago, of which four have the air-vessel free and three have it enclosed in bone; but, of these last three genera, *Clarias* is distributed through Africa and Asia so very widely that its presence is not to be wondered at, whilst only three species amongst the last two genera are recorded from the Malay archipelago. This brings one to the proposition that *the necessity for this bony capsule to the air-vessel is greater in India and Burmah than in the Malay archipelago*; and, secondly, one is naturally led to the conclusion that *this protection is for the freshwater, not for the marine, Siluroids*.

It will now be necessary to briefly consider whether amongst these freshwater groups any general law of distribution holds good†

* This intermediate hilly district appears to commence from about Darjeeling in the Subhimalayas to a line including the Khasia hills on the other side of Bramahputra, and extends to the hilly regions towards or in Burmah. It has yet to be fully explored zoologically.

† I do not enter more fully into the distinction between the Siluroids of India and Burmah, as my collections of the fishes of this last district have not yet been thoroughly worked out and are in Europe.

which may furnish one with a clue to the reason for the existence of this osseous covering, whether such is for protection or whether a part of the auditory apparatus.

Of the twenty-four Indian genera adverted to, we find some residents in waters of the plains, also in rivers on the hills with or without alpine sources.

Amongst the seventeen resident in waters of the plains and not extending their range into hilly regions we find in seven the air-vessel is free, viz. in *Rita*, *Hara*, *Pseudentropius*, *Macrones*, *Callichrous*, *Wallago*, and *Pangasius*; whilst in ten it is more or less enclosed in bone, viz. *Ailia*, *Ailiichthys*, *Sisor*, *Bagarius*, *Saccobranchus*, *Silundia*, *Eutropiichthys*, *Gagata*, *Clarias*, and *Hemipimelodus*.

Amongst those residing in rivers of the plains and extending their range into those of the hills which have or are destitute of alpine sources, we perceive as follows:—

Of those four genera which are found in the waters of the plains as well as in hill-rivers with alpine sources, all have their air-vessels enclosed in bone, viz. *Amblyceps*, *Pseudecheneis*, *Exostoma*, and *Glyptosternum*; whilst the last three genera have representatives in the next division, and all are furnished with an adhesive apparatus.

Of the three genera found in rivers of the plains and also in those of hills destitute of alpine sources, none have their air-vessels enclosed in bone, viz. *Silurus*, *Olyra*, *Akysis*.

From the foregoing it appears that the majority of the genera of Indian freshwater Siluroids have their air-vessels enclosed in bone;

That no true Indian, wholly marine Siluroid has its air-vessel enclosed in bone;

That amongst the Siluroids of the hilly regions, those which ascend rivers having alpine sources have the air-vessel enclosed in bone;

That those which ascend rivers not snow-fed do not appear of necessity to have their air-vessels thus protected.

Space and time will not permit me to enter further on this subject at present, which, however, I hope to do at no very distant date.

2. On a small Collection of Butterflies from Angola.

By A. G. BUTLER, F.L.S., F.Z.S., &c.

[Received November 8, 1871.]

The present collection, though it only contains twenty-four species, of which three are new to science, is interesting as an addition to our knowledge of the Butterflies of Angola; it was made at Loanda, the capital of the Portuguese settlements in Angola, situated at 1000 feet elevation, at between 8° and 9° S. lat. Fourteen of the species in the following list were also in my list of the Diurnal Lepidoptera taken by Mr. Ansell at Kinsembo. This collection has been lent to me for determination by my friend and brother lepidopterist R. Meldola, Esq.

Family NYMPHALIDÆ.

Subfamily DANAINÆ, Bates.

Genus DANAIS, Latreille.

1. DANAIS CHRYSIPPUS.

Papilio chrysippus, Linnæus, Syst. Nat. ii. p. 767 (1766).

2. DANAIS LEONORA.

Danais leonora, Butler, P. Z. S. p. 51. n. 35 (1862); Lep. Exot. vii. p. 53. n. 1, pl. 20. fig. 2 (1871).

The sides of the abdomen in *D. leonora* are deep orange, as in the genus *Godartia*.

Subfamily SATYRINÆ, Bates.

Genus MYCALESIS, Hübner.

1. MYCALESIS CAFFRA.

Mycalesis caffra, Wallengren, Lep. Rhop. Caffr. p. 34. n. 2 (1857).

Subfamily NYMPHALINÆ, Bates.

Genus NEPTIS, Fabricius.

1. NEPTIS AGATHA.

Papilio agatha, Cramer, Pap. Exot. iv. pl. 327. figs. A, B (1782).

2. NEPTIS NEMETES.

Neptis nemetes, Hewitson, Exot. Butt. iv. *Nept.* pl. 1. figs. 1, 2 (1868).

Genus JUNONIA, Hübner.

1. JUNONIA CREBRENE.

Junonia crebrene, Butler (*cebrene*, Trimen), Trans. Ent. Soc. London, p. 524. n. 9 (1870*).

2. JUNONIA CLELIA.

Papilio clelia, Cramer, Pap. Exot. i. pl. 21. figs. E, F (1775).

3. JUNONIA CLOANTHA.

Papilio cloantha, Cramer, Pap. Exot. iv. pl. 338. figs. A, B (1782).

Genus EURYTELA, Boisduval.

1. EURYTELA DRYOPE.

Papilio dryope, Cramer, Pap. Exot. i. pl. 78. figs. E, F (1779).

* My paper describing this species was read on the 4th July, and before the arrival of Mr. Trimen's paper in this country; it was also published in the same part of the Transactions with his. Were it possible I would gladly cede the right to the species; but as it is not so, I am compelled to quote it as above.

Genus ROMALEOSOMA, Blanchard.

1. ROMALEOSOMA CERES.

Papilio ceres, Fabricius, Syst. Ent. p. 504. n. 257 (1775).

One specimen of the variety figured in Lep. Exot. pl. 31. fig. 1 (Oct. 1, 1871), but slightly duller in colouring.

2. ROMALEOSOMA MEDON.

Papilio medon, Linnæus, Syst. Nat. i. 2, p. 753. n. 43 (1766).

Genus EURYPHENE (Boisd.), Westwood.

1. EURYPHENE MARDANIA.

♀. *Papilio mardania*, Fabricius, Ent. Syst. iii. p. 249. n. 776 (1793).

♂. *Papilio cocalia*, Fabricius, Ent. Syst. iii. p. 250. n. 777 (1793).

Two males only. This species is rare in collections.

Genus ATERICA, Boisduval.

1. ATERICA RIBENSIS?

Euryphene ribensis, Ward in Ent. Mo. Mag. p. 35 (1871).

It is impossible to be certain of the identity of this species with that characterized by Mr. Ward, in consequence of the extremely meagre description given by him; it, however, agrees very fairly with it as far as it goes.

Subfamily ACRÆINÆ, Bates.

Genus ACRÆA, Fabricius.

1. ACRÆA SERENA.

Papilio serena, Fabricius, Syst. Ent. p. 461. n. 76 (1775).

2. ACRÆA EPONINA.

Papilio eponina, Cramer, Pap. Exot. iii. pl. 268. figs. C, D (1782).

Family LYCÆNIDÆ, Stephens.

Subfamily LYCÆNINÆ, Butler.

Genus LAMPIDES, Hübner.

1. LAMPIDES BÆTICUS.

Papilio bæticus, Linnæus, Syst. Nat. ii. p. 789 (1766).

2. LAMPIDES HINTZA?

Lycæna hintza, Trimen, Rhop. Afr. Austr. ii. p. 243. n. 144 (1866).

I believe I have correctly identified this Butterfly; but the species

are so nearly allied in this genus, their number so great, and their markings so complicated, that it is impossible, in most cases, without the assistance of figures or types, to be certain of the identification of a species, even though characterized by so careful a describer as the author of 'Rhopalocera Africæ Australis.'

Family PAPILIONIDÆ (Doubl.), Bates.

Subfamily PIERINÆ, Bates.

Genus TERIAS, Swainson.

1. TERIAS SENEGALENSIS.

Terias senegalensis, Boisduval, Sp. Gén. Léop. i. p. 672 (1836).

2. TERIAS PULCHELLA.

Xanthidia pulchella, Boisduval, Faune de Madag. p. 20, pl. 2. fig. 7.

Genus TERACOLUS, Swainson.

1. TERACOLUS LOANDICUS, sp. n.

♂. *Alæ supra albæ, apice late aurantiaco, fusco cincto, extrorsum sinuato; area basali cinereo rorata: posticæ punctis sex decrescentibus marginalibus venas terminantibus; corpus nigrum, griseo-hirtum.*

Alæ subtus albæ; anticæ area apicali flava, plaga subapicali diffuse aurantiaca: posticæ roseo tinctæ fusco roratæ, stria discali interrupta squamosa fusca; puncto discocellulari nigro, introrsum fulvo cincto: exp. alar. unc. 1, lin. 6-8.

♀. *Alæ supra albæ; anticæ puncto discocellulari nigro; area apicali late aurantiaca; fascia lata subapicali subangulata, venis apicalibus et margine lato externo, nigris; area basali-interna cinereo-squamosa: posticæ margine externo angulis alternis dentato nigro; puncto costali et nebula centrali discali squamosis nigris; area basali cinereo-squamosa.*

Alæ subtus, anticæ albæ, area apicali ochracea, fascia lata diffusa puncta grisea includente aurantiaca; costa flavida, puncto discocellulari nigro: posticæ ochraceæ costa basali aurantiaca, aliter velut in mare: exp. alar. unc. 1, lin. 6.

2. TERACOLUS INTERRUPTUS, sp. n.

♂. *Alæ supra albæ, area apicali aurantiaca, a stria media valde indistincta interrupta, hac maculam distinctam in nervulo secundo mediano formante; venis apicalibus extrorsum nigrescentibus et margine profundius dentato-sinuato; area basali ochraceo tincta: posticæ maculis marginalibus fasciam angulis alternis formantibus; area interno-basali ochraceo tincta; aliter velut in specie præcedente: exp. alar. unc. 1, lin. 7.*

♀. *Similis speciei præcedenti, differt area apicali anticarum dilutius aurantiaca; fascia subapicali tenuiore, introrsum sinuata; area*

basali ochraceo tincta: posticæ nebula discali obsoleta; area basali ochraceo tincta: exp. alar. unc. 1, lin. 6.

Two examples of the male of this species were in the collection sent by Mr. Ansell from Kinsembo, a list of the species of which appeared in the Transactions of the Entomological Society for 1870 (see Tr. Ent. Soc. p. 527. n. 9).

Genus BELENOIS, Hübner.

1. BELENOIS MELDOLÆ, sp. n.

Affinis B. thysæ, minor; anticæ margine externo duplo angustiore et inter venas interrupto; punctis discalibus obsoletis; posticæ margine haud maculato.

Alæ anticæ subtus haud nigro maculatæ; area basali rufescente: posticæ puncto minuto costali, altero valde indistincto subapicali, tertio indistincto inter nervulos secundum et tertium medianos et quarto vix distinguendo inter nervulos primum et secundum, submarginalibus squamosis nigris, aliter haud nigro maculatæ: exp. alar. unc. 2, lin. 2.

Allied to *B. thysa*, Hopffer (*Papilio sabrata*, Doubleday), but quite distinct.

2. BELENOIS SEVERINA.

Papilio severina, Cramer, Pap. Exot. iv. pl. 338. figs. G, H (1782).

A number of specimens of this species came also in Mr. Ansell's collection.

Genus HERPÆNIA, Butler.

1. HERPÆNIA TRITOGENIA.

Pieris tritogenia, Klug & Ehrenberg, Symb. Phys. Ins. ii. pl. 8. figs. 17, 18.

3. Description of a new Genus of Lepidoptera allied to *Apatura*. By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

[Received November 8, 1871.]

Whilst verifying the *Apaturæ* in the collection of the British Museum, my attention was arrested by an extraordinary development of the anal appendages in one of the species. This led me to examine with care the rest of the Butterflies referred to this genus; and as I found that none of them exhibited the same peculiarities of structure, I came to the conclusion that it must be separated as a distinct genus. Further comparison has revealed differences in the antennæ and neururation, which, taken together with peculiarities of coloration and in the outline of the wings, will obviate that difficulty of determining the genus which is so much to be deplored in

such genera as *Appias* and *Belenois* of the *Pierinæ*, in consequence of the fact that their structural distinctions are confined to the male sex.

At page 395 of the 'Genera of Diurnal Lepidoptera,' in a footnote, Prof. Westwood characterized the typical species of this new genus under the name of *Apatura osteria*, the type being in the collection of the British Museum; as it was at that time the only example we possessed, and was destitute of an abdomen, no notice was taken in the diagnosis of the form of its anal valves; and consequently the species has remained without molestation in the genus *Apatura* up to the present time.

In the year 1868 a pair of *A. osteria*, in fair condition, were presented to the Museum by R. B. Were, Esq., who took them in India; in 1869 a male in good order was obtained from a collection made in Sarawak by Mr. Lowe; and last year Lieut. Henry Roberts presented a fine pair taken by himself at Singapore.

The female of *A. osteria* is of an olive-brown colour above, the primaries with a macular angulated white band, which becomes obscured by olive-brown in the secondaries; the discal area beyond this band is semihyaline and whitish in the primaries, and is followed by two obliquely placed subapical white spots and a submarginal series of whitish lunules; there is also a white-zoned blind ocellus between the first and second median branches; the discal area of the secondaries is ochreous brown, crossed by a darker brown macular bar, and followed by a series of broad white-zoned brown spots, bounded externally by brown, the margin pale brown; a black blind ocellus between the first and second median branches. In the shape of the wings and the colouring of the male this Butterfly reminds one of the smaller African species of the genus *Charaxes*; the hind wings, however, possess no trace of the tails so common in that genus.

EULACEÛRA, gen. nov.

Nearly allied to *Apatura*, but differing in its comparatively longer and more graceful anterior, and its shorter and more rounded posterior wings; antennæ longer, more slender, the club somewhat compressed laterally; median nervure of posterior wings longer, and consequently second and third median branches shorter.

Abdomen of male with anal valves composed of an upper hood-like lip, fringed externally with short hair-scales, and sheathing the penis, which is shorter and more spine-shaped than in *Apatura*, and projects obliquely downwards between two bispinose lateral walls of horny texture, and in shape resembling the open beak of a bird; the lower lip is formed by the union of two closely fitting horny sheaths, deeply excavated within, and terminating abruptly in two strong, perpendicular, somewhat curved, tapering, horny hooks, about a line and a half in length.

Typical species *EulaceÛra osteria*, Westwood.

4. A List of Species of Shells from West Africa, with Descriptions of those hitherto undescribed. By EDGAR A. SMITH, Zoological Department, British Museum.

[Received November 13, 1871.]

(Plate LXXV.)

The British Museum has lately received (1870) a series of shells from the Slave Coast, West Africa. They were all collected by the late Capt. Knocker, R.N., the majority of them being dredged at Whydah, on the Dahomey shore. As the knowledge of precise localities is always of value to the zoologist, in furtherance of a knowledge of geographical distribution, I thought it would be useful to publish the following list, at the same time adding descriptions of those species which appear to be new to science.

CONCHIFERA.

1. *VENUS DECLIVIS*, Sow. jun., Thesaur. Conch. ii. p. 730, pl. 157. f. 123, 124.

Hab. West Africa.

Mr. Sowerby gives "Eastern Seas" as the locality of this species.

2. *VENUS CASINA*, Linn. Syst. Nat. p. 1130.

Hab. Whydah.

This well-known European species has not been before recorded from West Africa. Mr. R. M'Andrew found it at the Madeira Islands.

3. *DIONE FLORIDELLA*, Gray, Analyst, viii. p. 306.

Hab. Whydah.

4. *DIONE VIRGO*, Gray, Cat. Cyth. Anal. viii. p. 306.

Hab. Whydah.

This species is also found at Java (*Cuming*). Capt. Knocker collected a variety, which is of a broader and more depressed form than typical specimens.

5. *DIONE TELLINÆFORMIS*, Phil. Abbild. Conch. iii. p. 59, pl. 9. f. 1.

Hab. Whydah.

6. *TRIGONA TRIPLA*, Linn. Mantissa, p. 545.

Hab. West coast of Africa.

7. *TELLINA (MACOMA) UMBONELLA*, Lamk. Anim. s. Vert. ed. 2, vi. p. 606.

Hab. Whydah.

This species is also found at Port Lincoln, South Australia (Angas, P. Z. S. 1865, p. 647).

8. DONAX RUGOSUS, Linn. Syst. Nat. (12th ed.) p. 112^r.

Hab. Whydah.

9. DONAX (CAPSELLA) OWENII, Gray, MS. in Brit. Mus.; Hailey, Cat. Rec. Shells, p. 81.

Hab. Whydah.

10. MACTRA (TRIGONELLA) ADANSONI, Phil. Zeitsch. für Malac. 1848, p. 152.

Hab. Whydah.

11. MACTRA (SCHIZODESMA) NITIDA, Schröter, Einl. Conch. iii. pl. 8. f. 2.

Hab. Whydah.

12. CHAMA SENEGALENSIS, Reeve, Conch. Icon. iv. sp. 5.

Hab. Whydah.

13. LEDA ROSTRATA, Mont. Test. Brit. Suppl. p. 55, pl. 27. f. 7.

Hab. Whydah.

14. LEDA TUBERCULATA, sp. nov. (Plate LXXV. fig. 1.)

Testa inæquilateralis, oblonga, postice modice rostrata, griseo-alba; antice plicæ 3 ad 4 oblique longitudinales, striis transversis confertim decussatæ; postice vel rostro tubercularum parvarum series 5 ad 6 obliquæ umbone radiantes; regione centrali costæ 16 concentricæ, crassæ; versus umbonem et marginem ventralem densissimæ; interstitia exilius striata.

Diam. transversa 8 mill., diam. longit. 4.

Hab. Whydah.

15. LEDA, sp. ? jun.

Hab. Whydah.

A small, very strongly, obliquely ribbed species, but too young to satisfactorily determine.

16. SOLEN (CULTELLUS) TENUIS, Gray, ? MS. in Brit. Mus.

Hab. Whydah.

17. CORBULA MODESTA, Hinds, P. Z. S. 1843, p. 57.

Hab. Whydah.

This species is described by Hinds as coming from Macassar and the Philippine Islands.

18. CORBULA STRIATA, sp. nov. (Plate LXXV. fig. 3.)

Testa parva, æquilateralis, paululum rostrata, albida cum macula triangulari rosea ornata; transversim crasse costata; striæ longitudinales exilissimæ creberrimæ supra et inter costas radiantes.

Diam. transversa 6 mill., diam. longit. $3\frac{1}{2}$.

Var. *Omnino rufo-fusca*.

Hab. Whydah.

19. *CORBULA LIRATA*, sp. nov. (Plate LXXV. fig. 2.)

Testa pyriformis, modice rostrata, sordido-alba, transversim costata; costæ versus marginem ventralem crassiores; carina obliqua in utraque valva ab umbone ad rostri apicem decurrens; de umbonibus costulæ filiformes paululum remotæ ad basim radiantes; valva dextra minor quam sinistra.

Diam. transversa 8 mill., diam. longit. 5.

Hab. Whydah.

The thread-like costulæ (about 24 in number) which radiate from the umbones are very remarkable.

20. *CRASSATELLA*, sp. jun.

Hab. Whydah.

21. *ACTINOBOLUS AJAR*, Brug. Enc. Méth. Vers, vol. i. part 2, p. 406.

Hab. Whydah.

22. *CRENELLA (MODIOLARIA) MULTISTRIATA*, sp. nov. (Plate LXXV. fig. 4.)

Testa æquivalvis, inæquilateralis, flavo-castanea, transversim striata; antice et postice striis crebris decussata; striæ posteriores valvæ dimidium occupantes; interstitium non decussatum, parvum.

Diam. transversa 15 mill., diam. longit. 7.

Hab. Whydah.

One specimen is imbedded in a nidus (formed of pieces of shells, pebbles, &c.) within the valve of a *Pecten*.

23. *ANOMALOCARDIA STRIATA*, Reeve, Conch. Icon. ii. sp. 121.

Hab. Whydah. "——?" (Reeve).

24. *ANOMALOCARDIA*, sp.

Hab. Whydah.

There are twelve equal-sized specimens of this species; but the small dimensions (5 mill. lata, 3 alt.) and general appearance of young examples make me hesitate in describing them.

They are oblong, rhomboidal, with the surface very finely decussated.

25. *SCAPHARCA PERTUSA*?, Reeve, Conch. Icon. ii. sp. 28.

Hab. Whydah.

26. *AXINEA SPADICEA*, Reeve, Conch. Icon. i. sp. 47.

Hab. Whydah.

The locality for this species was hitherto unrecorded.

27. *NUCULA CRASSICOSTATA*, sp. nov. (Plate LXXV. fig. 5.)

Testa parva, transversa, oblique subovalis; albida, versus umbones

fusco tincta, nitens; valvæ concentricè fortiter costatæ; valvarum margines inter crenulatæ.

Diam. transversa 2 mill., diam. longit. $1\frac{1}{2}$.

Hab. Whydah.

A very strongly ribbed species, one of the smallest of the genus, and the first recorded from West Africa, I believe.

28. PECTEN PSEUDAMUSIUM, Klein, Meth. Ost. p. 134, pl. 9. f. 31.

Hab. Whydah.

29. OSTREA GUINEENSIS, Dkr. Novit. Conch. Suppl. ii. p. 43, pl. 7. figs. 12-18.

Hab. Whydah.

This species was discovered by Dr. Tams at Loanda, about 1400 miles south of Whydah.

BRACHIOPODA.

30. LINGULA PARVA, sp. nov. (Plate LXXV. fig. 6.)

Testa oblongo-ovalis, versus apicem parum attenuata, pallido flavida, lævis; valvæ clausæ.

Diam. transversa 5 mill., diam. longit. 10.

Hab. Whydah.

PTEROPODA.

31. BALANTIUM RECURVUM, Children, Journ. of Sci. Lit. & Arts, 1824.

Hab. Whydah.

GASTEROPODA.

32. TEREBRA FESTIVA, Desh. Journ. de Conch. vi. p. 74, pl. 3. f. 4.

Hab. West Africa.

33. TEREBRA (MYURELLA) MARGINATA, Desh. Journ. de Conch. vi. p. 86, pl. 4. f. 8.

Hab. Whydah.

34. TEREBRA (MYURELLA) SOWERBYANA, Desh. Journ. de Conch. vi. p. 93, pl. 3. f. 8.

Hab. Whydah.

35. TEREBRA (ABRETIA) KNOCKERI, sp. nov. (Plate LXXV. fig. 7.)

Testa elongato-subulata, pallide brunnea; infra suturam zona alba et ad peripheriam angustiore ornata; apex fuscus; anfractus 14, primi 4 convexi, politi, cæteri plane convexi, longitudinaliter costati, in anfractu ultimo costæ 16; apertura parva, angusta; columella fusco tincta, modice contorta.

Long. 20 mill., diam. 4.

Hab. Whydah.

36. *TEREBRA MICANS*, Hinds, Proc. Zool. Soc. 1843, p. 157.
Hab. West Africa.
37. *PLEUROTOMA SPIRALIS*, sp. nov. (Plate LXXV. fig. 8.)
Testa fusiformis, pallido-fusca; anfract. 18, primi 3 politi, convexi, cæteri plane convexi, carina acuta in medio succincti; anfract. ultimus cingulis 12 æqualibus ornatus; sutura cingulo minore definita; interstitia oblique striata; apertura angusta; columella nigro-fusca; canalis brevissimus; labium tenue; incisura magna.
 Long. 11 mill., diam. 3.
Hab. Whydah.
 This species belongs to the same group as *P. violacea*, Hinds.
38. *DRILLIA PYRAMIDATA*, Kiener, Icon. Coq. Viv. Monog. Pleurotoma, p. 57, pl. 21. f. 4.
Hab. Whydah.
39. *DRILLIA (CRASSISPIRA) CARBONARIA*, Reeve, Proc. Zool. Soc. 1843, p. 187.
Hab. West Africa. "——?" (Reeve).
40. *PERRONA LINEATA*, Lamk. Anim. s. Vert. ed. 2, vol. ix. p. 348.
Hab. Whydah.
41. *CLATHURELLA LABIOSA*, sp. nov. (Plate LXXV. fig. 9.)
Testa elongato-ovata, albida; anfract. 6, infra suturam pellucide zonati, modice convexi, superne subangulati, oblique longitudinaliter valide costati, transversim sulcati; sulci supra costas indistincti; apertura angusta, elongata, spiram æquans, ad basim contracta; incisura distincta; labium crassissimum.
 Long. 5 mill., diam. $1\frac{1}{2}$.
Hab. Whydah.
42. *MANGELIA ANGULOSA*, sp. nov. (Plate LXXV. fig. 10.)
Testa parva, ovata, pallido-brunnea; anfract. 6, primi 4 convexi, politi, simplices, cæteri medio angulati, costis validis, curvatis, remotis (in anfract. ultimo 6) ornati; transversim exilissime striati; striæ supra costas indistinctæ; apertura subovata, spiram fere æquans; columella callosa, superne tuberculata; labium incrassatum; canalis perbrevis.
 Long. 5 mill., diam. $1\frac{3}{4}$.
Hub. Whydah.
43. *MUREX TURBINATUS*, Lamk. Anim. s. Vert. ed. 2, vol. ix. p. 586.
Hab. Whydah.

44. *NASSA TRITONIFORMIS*, Kiener, Coq. Viv. Buccinum, pl. 30. fig. 2, p. 108.

Hab. Whydah.

45. *NASSA PUMILIO*, sp. nov. (Plate LXXV. fig. 11.)

Testa minima, ovata, albido-cornea, nitida; anfract. 6, convexi; primi 3 politi, simplices, cæteri costis validis (in anfract. ultimo 12) ornati, costulis transversis (in anfract. tertio et quarto 4) decussati; apertura parva; columella callosa; labium incrassatum, intus denticulatum, extra rufo trimaculatum.

Long. $3\frac{1}{2}$ mill., diam. fere 2.

Hab. Whydah.

A very pretty minute species, neatly cancellated, producing a noded appearance, whitish, with a line beneath the suture and the lower part of the last whorl horn-colour.

46. *NASSA (NAYTIA) GLABRATA*, Sowerby, Thesaurus i. Monog. Strombus, p. 32, pl. 8. f. 66, 67.

Hab. Whydah. “?” (*Sowerby*).

47. *CYLLENE OWENII*, Gray, MS.; Sowerby, Thesaur. Conch. iii. p. 78, pl. 217. f. 19, 20.

Hab. Whydah.

48. *PURPURA HÆMASTOMA*, Linn. Syst. Nat. ed. 1, ii. p. 1202.

Hab. Lagos, West Africa.

49. *PUSIONELLA MILLETI*, Petit, Journ. de Conch. ii. p. 76, pl. 1. f. 6.

Hab. Whydah.

50. *OLIVA FLAMMULATA*, Lamk. Anim. s. Vert. ed. 2, vol. x. p. 613.

Hab. Whydah. “West Indies” (*Reeve*, Conch. Icon.).

51. *OLIVA SUBULATA*, Lamk. Anim. s. Vert. ed. 2, p. 626.

Var. *pallida*.

Entirely pinkish cream-coloured, with basal zone still paler.

Hab. Whydah.

52. *OLIVA ACUMINATA*, Lamk. Anim. s. Vert. ed. 2, vol. x. p. 625.

Hab. Whydah.

53. *MITRA HEBES*, Reeve, Conch. Icon. ii. sp. 292.

Hab. Whydah. “——?” (*Reeve*).

54. *MARGINELLA EPIGRUS*, Reeve, Conch. Icon. xv. sp. 151.

Hab. Whydah.

This species was collected also by Mr. R. M'Andrew at Mogador, Morocco.

55. *RINGICULA GRANDINOSA*, Hinds, Proc. Zool. Soc. 1844, p. 96.

Hab. Whydah. "Philippines" (*Cuming*).

56. *RINGICULA SUTURALIS*, sp. nov. (Plate LXXV. fig. 12.)

Testa ovata, alba, polita; spira acuminata, sutura chorda callosa cincta; anfract. 5, convexi, spiraliter sulcati; in anfract. ult. sulci 10; apertura pyriformis; columella callosa triplicata; labrum extra valide incrassatum.

Long. $2\frac{3}{4}$ mill., diam. maj. fere 2.

Hab. Whydah.

This minute species belongs to the same striated group as *R. pro-pinquans*, Hinds, from the Philippines and *R. someri*, De Folin, from the Cape-Verd Islands. Its much smaller size, the number and position of the teeth, and the callous chord around the suture of the whorls well distinguish it.

57. *TRITON SAMIER*, Adanson, Voy. Sénégal, p. 122, t. 8. f. 1.

Hab. West Africa.

58. *NATICA COLLARIA*, Lamk. Anim. s. Vert. ed. 2, vol. viii. p. 638.

Hab. West Africa, Whydah.

59. *NATICA SAGRATA*, D'Orb. Moll. Cuba, pl. 18. f. 20-22.

Hab. Whydah.

I have compared the shells which I refer to this species with the typical specimen in D'Orbigny's collection of Cuban shells in the British Museum, and find that they are identical; therefore this species appears to be found in the Mediterranean (Malaga), *Reeve* (Con. Icon. ix. sp. 111), West Africa (Whydah), *Knocker*, and West Indies (Cuba), *D'Orbigny*.

60. *NATICA MAROCHIENSIS*, Lamk. Anim. s. Vert. ed. 2, vol. viii. p. 642.

Hab. Whydah. "Morocco and West Indies" (*Lamarck* and *Reeve*, Conch. Icon. ix.).

61. *NATICA RUBRO-MACULATA*, sp. nov. (Plate LXXV. fig. 13.)

Testa globosa, lævis, umbilicata; spira breviuscula; anfract. 5, convexi, infra suturam leviter depressi et oblique sulcati, lineis longitudinalibus leviter undulatis et maculis subquadratis remotis aurantio-rubris (in anfr. ult. trifasciatim) ornati; columella recta.

Alt. maj. 15 mill., diam. maj. 15.

Hab. Whydah.

A very distinct solid species, longitudinally lined, and with three interrupted bands of squarish reddish spots encircling the last whorl; these bands are sometimes altogether absent, and sometimes there are but one or two.

62. *IANTHINA BALTEATA*, Reeve, Conch. Icon. xi. sp. 11.

Hab. North Atlantic?

63. *SCALA MIRANDA*, sp. nov. (Plate LXXV. fig. 15.)

Testa pyramidalis, imperforata, grisea; anfract. 8, perconvexi, varicibus obliquis numerosissimis tenuissimis (in anfract. ultimo 45) ornati; spiraliter minute sed distincte striati; apertura subcircularis.

Long. 9 mill., diam. 4.

Hab. Whydah.

A very numerous and finely variced species, with very convex whorls.

64. *SCALA BAIRDII*, sp. nov. (Plate LXXV. fig. 14.)

Testa elongata, subturrita, imperforata, albido-purpurascens; anfract. 9, subconvexi, costis crassis curvatis (in anfract. ultimo 14) instructi, spiraliter minutissime costas inter et supra striati; apertura ovata.

Long. 11 mill., diam. $3\frac{1}{2}$.

Hab. Whydah.

This is very distinct from any species yet known. The ribs are produced on to the whorls above, giving the sutural line a neat wavy appearance. Named after my kind friend Dr. Baird.

65. *ACLIS CARINATA*, sp. nov. (Plate LXXV. fig. 20.)

Testa elongata, sordide alba; anfract. 9, perconvexi, transverse tenuiter sulcati; ad peripheriam subacute carinata; apertura ovata, basi effusa.

Long. 10 mill., diam. $2\frac{1}{2}$.

Hab. Whydah.

A very graceful shell, with neatly sulcated whorls. The keel at the periphery is very remarkable.

66. *MONOPTYGMA (MYONIA) PUNCTURATA*, sp. nov. (Plate LXXV. fig. 16.)

Testa parva, elongato-ovata, subpellucida, brunneo-albida; anfract. 4, convexi, spiraliter valide punctato-sulcati; in anfract. ult. sulci 17; spira brevis, apice obtuso; apertura subovata, $\frac{1}{2}$ longitudinis paulo superans, basi subeffusa, marginibus callo tenui junctis; columella obliqua tortuosa.

Long. 5 mill., diam. 2.

Hab. Whydah.

The sculpture agrees with that of *M. amæna*, A. Ad. Proc. Zool. Soc. 1851, p. 223, from the Philippines; but the convexity and number of the whorls, the shortness of the spire, and the obtuse apex are sufficient characters by which it may readily be distinguished.

67. *OBELISCUS (SYRNOLA) GRACILLIMA*, sp. nov. (Plate LXXV. fig. 17.)

Testa imperforata, gracilis, elongata, polita, alba; anfract. 11,

primi 2 (nucleus) globosi, cæteri plani, infra suturam fascia diaphana ornati; sutura valde distincta; apertura pyriformis; columella uniplicata.

Long. $6\frac{1}{2}$ mill., diam. $1\frac{1}{4}$.

Hab. Whydah.

A very slender species, of a pure white colour, with the upper part of the whorl girdled with a pellucid zone.

68. *ODOSTOMIA SULCIFERA*, sp. nov. (Plate LXXV. fig. 19.)

Testa parva, alba, polita; anfract. 6; primus tubercularis, cæteri subplani, indistincte longitudinaliter striati, infra suturam zona pellucida ornati, et infra medium sulco lineari cincti; apertura pyriformis; columella leviter dentata.

Long. 5 mill., diam. 2.

Hab. Whydah.

The apex is not acnte, as in the Mediterranean *O. conoidea*, the spire is not so conical, and the columellar tooth is small.

69. *TURBONILLA COSTIFERA*, sp. nov. (Plate LXXV. fig. 18.)

Testa imperforata, elongata, pallido-fulva; anfract. 8, primi 2 (nucleus) perconvexi, cæteri planiusculi, longitudinaliter valide costati, inter costas striati, infra suturam fascia diaphana ornati; apertura subquadrata, parva; columella uniplicata.

Long. $5\frac{1}{2}$ mill., diam. $1\frac{1}{2}$.

Hab. Whydah.

70. *EULIMA DISTORTA*? (Desh.) Philippi, Moll. Sicil. i. p. 158, t. 9. f. 10.

Hab. Whydah. "Teneriffe" (*M'Andrew*).

Only differing from *distorta* in being nearly straight and a little broader.

71. *LEIOSTRACA BIVITTATA*, H. & A. Ad. Gen. Moll. i. p. 239.

Eulima bilineata, Ad. & Reeve, Voy. Samarang, p. 72, pl. 11. f. 24.

Hab. Whydah. "China Sea" (*Ad. & Reeve*). "Island of Negros, in coarse sand and gravel, 7 fms." (*Cuming*).

The shells referred to this species are generally smaller, a trifle broader, and the columella somewhat straighter and more thickened.

72. *TURRITELLA CANDIDA*, Reeve, Conch. Icon. v. sp. 38.

Hab. West Africa. "——?" (*Reeve*).

73. *TURRITELLA ANNULATA*, Kiener, Coq. Viv. p. 20, pl. 13. f. 1.

Hab. West Africa.

74. *PROTOMA KNOCKERI*, Baird, Proc. Zool. Soc. 1870, p. 59.

Hab. Whydah.

This new genus and species is well figured at the above page.

75. *TROCHITA CHINENSIS*, Linn. Syst. Nat. p. 1257.

Hab. Whydah.

A well-known European species, extending to the Canaries and West Africa.

76. *CERITHIUM* (*CERITHIOPSIS*?) *GEMMULIFERUM*, sp. nov. (Plate LXXV. fig. 22.)

Testa parva, elongata, pallido-brunnea; anfract. 11, primi 3 læves, perconvexi; ceteri subplani, triseriatim granulati; series infra-suturalis minima; apertura subquadrata; canalis brevis.

Long. 4 mill., diam. 1.

Hab. Whydah.

This species at times probably attains a larger size.

77. *CERITHIUM* (*CERITHIOPSIS*?) *CARINATUM*, sp. nov. (Plate LXXV. fig. 21.)

Testa elongata, pallido-brunnea; anfract. 15, primi 3 læves, convexi, ceteri plani, carinis tribus (infima maxima) cincti; interstitia longitudinaliter concinne striata; apertura subquadrata; canalis brevis.

Long. 6 mill., diam. basi $1\frac{1}{2}$.

Hab. Whydah.

78. *TRIPHORIS GRANULATA*, Ad. & Reeve, Voy. Samarang, p. 46, pl. 11. f. 33, a, b.

Hab. Whydah.

The shells referred to this Chinese species differ in one character from it; viz. the granules of the middle row are constantly smaller than those of the two adjacent ones, in this respect agreeing with *Triphoris fusca*, Dkr., from Japan.

79. *SOLARIELLA CANALICULATA*, sp. nov. (Plate LXXV. fig. 28.)

Testa parva, late umbilicata, margaritacea, pulcherrime prismatica; spira depresso-conica; anfract. 5, primi 2 læves, ceteri spiruliter livati et infra suturam canaliculatam tubercularum albidarum (hic illic castaneo notatarum) serie ornati; anfract. ult. carinis duabus custaneo-punctatis et basi zona purpureo-brunnea cinctus; umbilicus perspectivus, chorda tuberculari marginatus; apertura subcircularis.

Alt. 2 mill., diam. maj. 3.

Hab. Whydah.

A very pretty pearly species, with a channelled suture, and with a row of tubercles beneath it; about every seventh one is chestnut, the rest whitish. The umbilicus is girt with a somewhat tubercular chord and a zone of purplish brown.

80. *CYCLOSTREMA TRICARINATA*, sp. nov. (Plate LXXV. fig. 26.)

Testa parva, depressa, alba, late perspective umbilicata; anfract. 5, rapide augentes, spiraliter lirati; spira plana; sutura depressa; anfract. ult. acute tricarinatus; carina mediana maxima; apertura subhexagonalis; perist. carinis triangulatum, marginibus callo tenui junctis.

Alt. 1 mill., diam. maj. 3.

Hab. Whydah.

A prettily lirated, depressed species, with the body-whorl tricarinate, the centre keel being the largest.

81. *CYCLOSTREMA ROSEOTINCTA*, sp. nov. (Plate LXXV. fig. 27.)

Testa parva, pallido-rosea, valide umbilicata; anfract. 4, convexi, spiraliter leviter lirati, incrementi lineis subtiliter decussati; sutura depressa; apertura fere circularis; perist. continuum.

Alt. $1\frac{1}{2}$ mill., diam. maj. $1\frac{3}{4}$.

Hab. Whydah.

This species has somewhat the appearance of a non-pearly *Margarita*, and it is with doubt that I refer it to *Cyclostrema*.

82. *ETHALIA LIRATA*, sp. nov. (Plate LXXV. fig. 23.)

Testa parva, alba, subimperfurata; anfract. $3\frac{1}{2}$, spiraliter tenue lirati, infra suturam et circa regionem umbilicalem radiatim valde plicati; apertura circularis; perist. continuum, crassum.

Alt. 2 mill., diam. maj. 3.

Hab. Whydah.

A somewhat globular species, finely lirate spirally, and beneath the suture and the umbilical callosity strongly plicate.

83. *ETHALIA PLICATA*, sp. nov. (Plate LXXV. fig. 24.)

Testa parva, alba, lævis; anfract. $3\frac{1}{2}$, rapide augentes; incrementi lineis subtilissime striati; spira depressa; sutura callosa, oblique sulcata; regio umbiliculis callositate plicata partim oblecta; apertura circularis; perist. solidum, marginibus callo crassissimo junctis.

Alt. $1\frac{1}{4}$ mill., diam. maj. $2\frac{1}{3}$.

Hab. Whydah.

A small, nearly smooth species, with a callous sulcate suture to the whorls, and also a callosity nearly concealing the umbilicus; in many respects agreeing with the genus *Leucorhynchia* of Crosse.

84. *TEINOSTOMA SOLIDA*, sp. nov. (Plate LXXV. fig. 25.)

Testa solida, parva, pallido-fulva, lævis; anfract. 4, rapide augentes, ultimus superne lævis, basi planiusculus, spiraliter trisulcatus; regio umbilicalis callosa; apertura depresso-rotundata; perist. basi recedens.

Alt. 2 mill., diam. maj. $3\frac{1}{3}$.

Hab. Whydah.

A depressed species, plain above and trisulcate beneath.

85. DENTALIUM INVERSUM, Desh. Anim. s. Vert. ed. 2, vol. v. p. 599.

Hab. Whydah. West Indies (*Cuming coll.*).

86. FISSURELLA OBTUSA, Sowb. Conchol. Illust. fig. 59. no. 64. = ? *F. mutabilis*, Sowb. P. Z. S. 1834, p. 127.

Hab. Whydah. Cape of Good Hope (*Reeve, Conch. Icon.*).

87. PATELLA PLUMBEA, Lam. Anim. s. Vert. ed. 2, vol. vii. p. 530.

Hab. Lagos, West Africa.

88. CYLICHNA CYLINDRACEA, Pennant, Br. Zool. iv. p. 117, t. 70. f. 85.

Hab. Whydah.

This species is very widely distributed, being found at Shetland (*Jeffreys*), Madeira and Canaries (*M'Andrew*), Whydah (*Knocker*). The latter is the most southern locality yet known.

89. SCAPHANDER SCABER, Müll. Zool. Dan. ii. p. 41, pl. 71. f. 10-12.

Hab. Whydah.

The only difference I can detect in the present specimen is that it is a trifle narrower than typical specimens of *S. scaber*. The remark affixed to the preceding species applies to this also.

90. TORNATINA KNOCKERI, sp. nov. (Plate LXXV. fig. 30.)

Testa cylindrica, albida; spira turrita, perbrevis; apex tubercularis; anfract. 5, ultimus politus, lævis, superne angulatus et plicatus; apertura anfrac. ultimum subæquans; labium rectum; columella uniplicata.

Long. $4\frac{1}{2}$ mill., diam. 2.

Hab. Whydah.

Easily known by its flattish spire, tubercular apex, and the plications at the upper part of the body-whorl.

91. VOLVULA CYLINDRICA, sp. nov. (Plate LXXV. fig. 29.)

Testa minuta, elongato-ovata, superne rostrata, polita, alba, antice et postice transversim striata, medio lævis; apertura superne angusta, inferne dilatata; columella crassa.

Long. 5 mill., diam. 3.

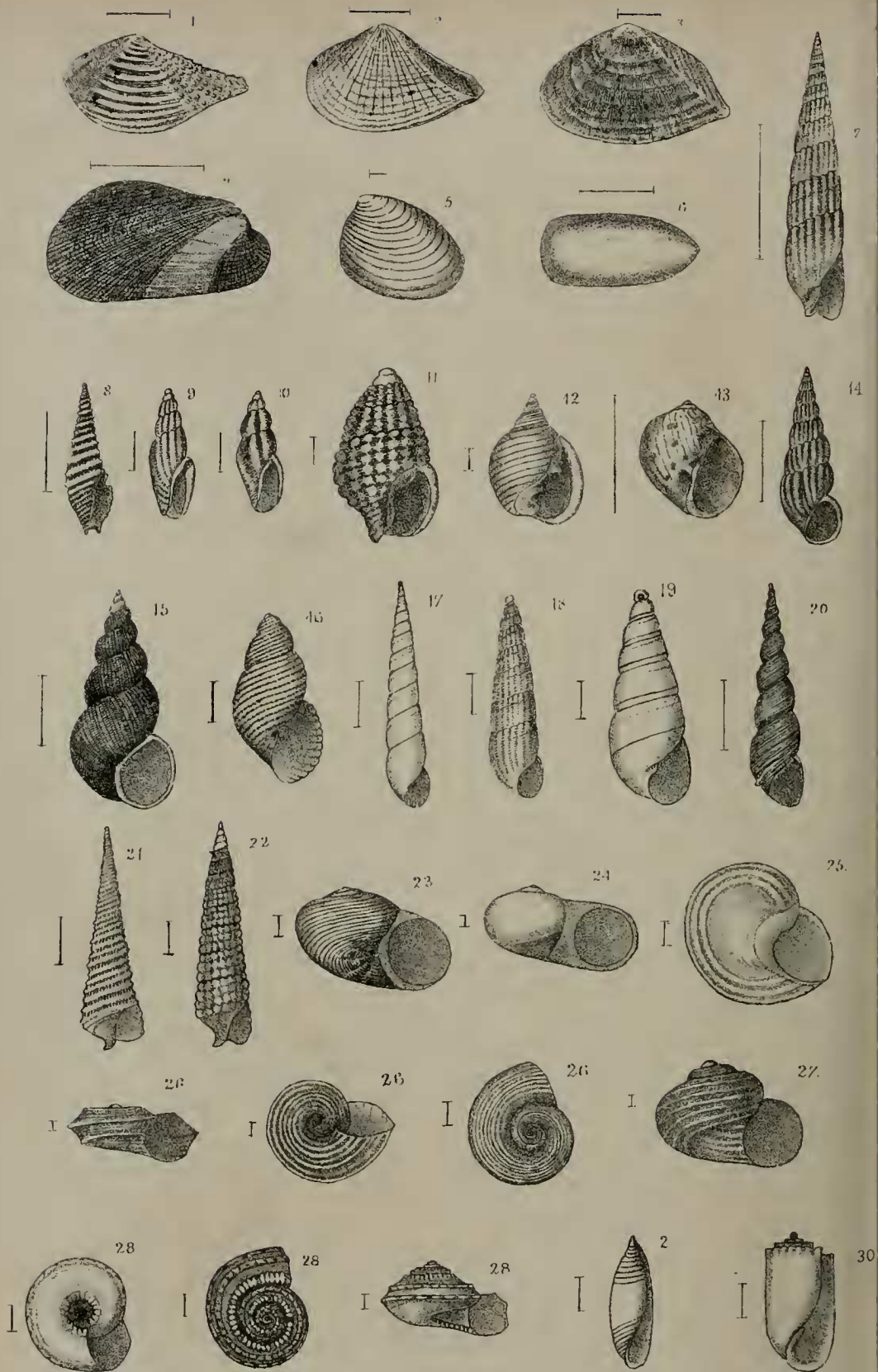
Hab. Whydah.

Peculiar for the beaked apex and the (about 12) spiral striæ at the upper and lower portions.

92. SIPHONARIA VENOSA, Reeve, Conch. Icon. ix. sp. 12.

Hab. Whydah. "Cape" (*Reeve*).





Edgar Smith, lith.

Manter Bros. imp.

DESCRIPTION OF PLATE LXXV.

- Fig. 1. *Leda tuberculata*, p. 728.
 2. *Corbula lirata*, p. 729.
 3. — *striata*, p. 728.
 4. *Crenella* (*Modiolaria*) *multistriata*, p. 729.
 5. *Nucula crassicostata*, p. 729.
 6. *Lingula parva*, p. 730.
 7. *Terebra* (*Abretia*) *knockeri*, p. 730.
 8. *Pleurotoma spiralis*, p. 731.
 9. *Clathurella lubiosa*, p. 731.
 10. *Mangelia angulosa*, p. 731.
 11. *Nassa pumilio*, p. 732.
 12. *Ringicula suturalis*, p. 733.
 13. *Natica rubro-maculata*, p. 733.
 14. *Scala bairdii*, p. 734.
 15. — *miranda*, p. 734.
 16. *Monoptygma* (*Myonia*) *puncturata*, p. 734.
 17. *Obeliscus* (*Syrnola*) *gracillima*, p. 734.
 18. *Turbonilla costifera*, p. 735.
 19. *Odostomia sulcifera*, p. 735.
 20. *Aclis carinata*, p. 734.
 21. *Cerithium* (*Cerithiopsis*?) *carinatum*, p. 736.
 22. — (*Cerithiopsis*?) *gemmaiferum*, p. 736.
 23. *Ethalia lirata*, p. 737.
 24. — *plicata*, p. 737.
 25. *Teinostoma solida*, p. 737.
 26. *Cyclostrema tricarinata*, p. 737.
 27. — *roscotincta*, p. 737.
 28. *Solariella canaliculata*, p. 736.
 29. *Volvula cylindrica*, p. 738.
 30. *Tornatina knockeri*, p. 738.

5. On the Asymmetry of the Skull in *Strix tengmalmi*.

By ROBERT COLLETT, Member of the Scientific Society of Christiania. (Communicated by Prof. NEWTON, M.A., F.R.S., V.P.)

[Received June, 1871.]

In all the *Strigidae* the 'os squamosum' forms posteriorly a sharp, projecting, and vertical 'crista,' having its greatest width almost exactly behind the 'fossa glenoidalis,' which, with a more or less distinct incision, bends downwards and half forwards in front of the ear-openings, thus serving without doubt to strengthen the organ of hearing in this Family.

In the greater number of North-European species (for example, *Strix nyctea*, *S. passerina*, *S. bubo*, *S. aluco*, and *S. flammea*) this 'crista' appears at the top like a round nail, the upper edge of which is separated by a distinct inflexion from the uppermost part of the bone, and proceeds downwards by a rather sharp incision in the lateral parts of the 'os occipitale.' In *Strix brachyotus* and *S. otus*, on the contrary, this 'crista' appears to be insensibly and without any inflexion joined with the uppermost part of the bone, and con-

Fig. 1.



Fig. 2.

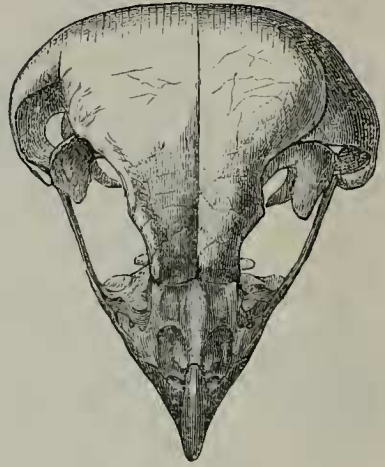


Fig. 3.

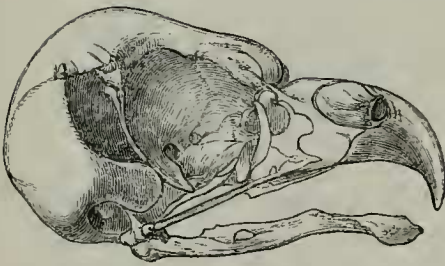


Fig. 4.

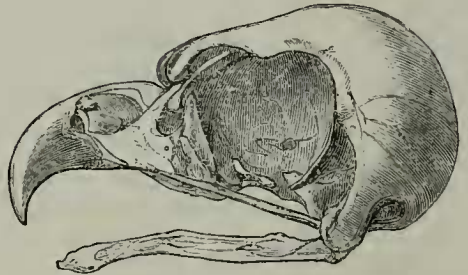


Fig. 5.

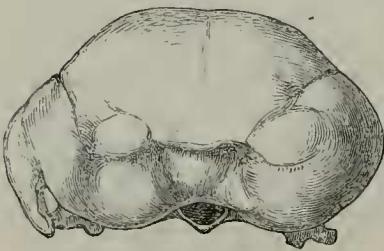
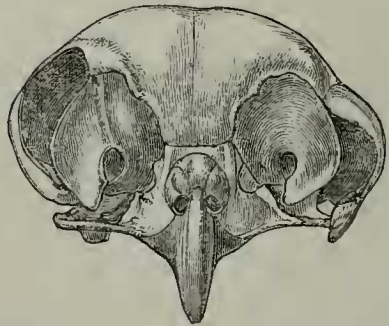


Fig. 6.



Skull of *Strix tengmalmi*, from different points of view, showing its asymmetry.

tinues without any incision of its margin down to the 'os occipitale.' From this cause there exists, in the two species last named, to a greater degree than in the others, a wall, open in front and closed behind, projecting to the sides. When the skulls are seen in front the 'cristæ' appear in these two species very distinctly, while in the rest they are almost completely hidden behind the 'processus orbitalis posterior.' I have not had an opportunity of examining the other species of the northern fauna not named here (*Strix funerea*, *S. liturata*, *S. lapponica* and *S. psilodactyla*); but I have seen several non-European species.

The wall just mentioned is peculiarly adapted to throw back the vibrations of sound and carry them on to the 'membrana tympani' in all the species which I have examined. I am therefore inclined to attribute to the nearly allied *Strix otus* and *S. brachyotus* a highly developed power of hearing. In a still greater degree, however, is this the case in *S. tengmalmi*, where this bone, and by consequence several of those adjoining it, has a very peculiar formation.

In *Strix tengmalmi* the 'crista' which the 'os squamosum' pushes forth in front of the ear-opening projects more considerably than in the other species; and as the outer edge of the 'crista' widens about the middle into a long tongue-shaped process, the whole 'os squamosum' surrounds a larger and deeper ear-cavity than in any of the other species with which I am acquainted.

But at the same time a very remarkable asymmetry appears in this 'crista.' On the *right* side (see figs. 2, 3, & 6, p. 740) it projects far upward and behind the upper edge of the 'os alisphenoideum;' and on the *left* side (see figs. 2, 4, & 6, p. 740), on the contrary, it leans immediately on the foremost edge of that bone and somewhat beneath its upper part. On both sides it normally joins in its lower part the 'os occipitale laterale' extending on the *right* considerably more (its height being here 20 mm.) than on the *left*, where its height is only 15 mm. On the *right* side, where this 'crista' has its largest extent and at the same time is drawn furthest back, it apparently projects at the top behind the point where the projecting end of the 'os parietale' meets the upper edge of the 'os squamosum.' Between where the 'crista' begins and the foremost edge of the remaining part of the 'os squamosum' (that point at which the last-mentioned bone touches the hinder edge of the 'os alisphenoideum') there is a proportionately considerable distance, amounting in four of the skulls examined by me to 7.25 mm. On the *left* side, on the contrary, the 'crista' projects at the top immediately at the point which the 'os squamosum' forms with the 'parietale,' 'frontale,' and the hinder edge of the 'alisphenoideum.' Here the 'crista' leans upon the upper (but not the uppermost) end of the 'processus orbitalis posterior.' Though this 'crista' at its upper end joins the 'os squamosum' very differently on either side, its lower part is apparently symmetrical and proceeds normally on both sides to the lateral parts of the perfectly symmetrical 'occipitale.'

In most of the Northern *Strigidae* the outer edge of the 'crista' has a distinct incision, bending downwards to the 'os occipitale'

below the middle. In *Strix otus* and *S. brachyotus*, however, it is almost entire and without any incision. But in *S. tengmalmi* there appears the peculiar extension, already mentioned, which reaches in front of the ear-openings and bends downwards and finally inwards.

This process in the 'crista' proves to be only asymmetrical in appearance, extending on the one side (where it is itself shorter than on the other) far more downwards than on the opposite side. On close examination it will be found that this process projects on both sides to an equal distance from the upper end of the 'crista;' and having the same length and curvature on each side, it consequently terminates higher up on the *right* side (where, as has been said, the 'crista' is longer) than on the *left* (where the 'crista' is shorter). The apparent asymmetry of this process is therefore not due to its own structure, but to the 'crista' itself.

While this extension of the *right* prolonged 'crista' bends forwards, downwards, and finally inwards, *above* the 'os jugulare,' and touches with its rounded extremity the lowest and outer edge of the 'processus orbitalis posterior,' it bends on the *left* side (which is shortened) *beneath* the 'os jugulare' and widens at its extremity into an oblong 'condylus,' which fits into and articulates (sometimes feebly but yet plainly) with a corresponding surface on the 'os coronoideum maxillæ inferioris,' jointly with the normal 'os quadratum' and 'os jugulare.' The 'cranium' in this way comes into immediate contact with the lower jaw (as seen in fig. 4, p. 740).

As to the other parts of the 'os squamosum,' it may be said that the 'processus zygomaticus' is but very feebly developed. The 'processus orbitalis posterior' seems in this species (as appears also to be the case in young examples of *Strix aluco*) to be formed solely of the 'os alisphenoides;' but, as in all the *Strigidae*, it is very strongly developed, forming a considerable part of the outer side-wall of the orbit, and bending down, like a flattened sharp-ending nail, before the 'os squamosum,' without (as is the case in *S. flammea*) reaching the 'os jugulare.'

The precise nature and extent of any asymmetry in the other bones, coalescent with the 'os squamosum,' I am not at present able to point out. That there must be a modification in a slighter degree of the 'os alisphenoides,' 'os frontale,' and 'os parietale' (especially of the last) is perfectly consequent, and it strikes the eye on a cursory examination of the skull. But for this purpose examples of younger individuals, which I have not yet obtained, are required. An examination of an immature example preserved in the Museum of the University of Christiania, the plumage of which is minutely described in the 'Nyt Magazin for Naturvidenskaberne' (xviii. p. 161), led to no result, the cranium (on account of its youth) being defective.

The observations above recorded are based on an examination of nearly a dozen skulls of *Strix tengmalmi*, all of which have proved to be alike even to the most minute particulars.

P.S.—Doubtless the nearly allied (if, indeed, specifically distinct)

North-American form, *Strix richardsoni*, will present a similar asymmetry. In the 'Proceedings of the Academy of Natural Sciences of Philadelphia' for 1870 (p. 73), Mr. Streets states that in the collection of the Academy there are two asymmetrical skulls of an Owl, which he supposes to be *S. acadica*; and these, from the short description, seem to show exactly the same asymmetry as *S. tengmalmi* does. It is possible that this remarkable feature is not peculiar to *S. tengmalmi* and its transatlantic relative, but that it may appear in all the species of the group *Nyctala*. However, until this is proved, there is reason to suspect that the skulls described by Mr. Streets as belonging to *S. acadica* are rather those of *S. richardsoni* *.

6. Notes on rare or little-known Animals now or lately living in the Society's Gardens. By P. L. SCLATER, M.A., Ph.D., F.R.S., Secretary to the Society.—Part III.† Reptiles.

[Received November 15, 1871.]

The concluding portion of my notes written during the preparation of the new edition of the 'List of Vertebrates' (which I hope to have ready very shortly) relates to the Testudinata, of which group we have of late years received a considerable number of specimens.

As regards the other Reptilia and the Batrachians, Dr. Günther has always had the kindness to name them for us; so that all doubtful specimens have been referred to his determination.

In the arrangement and nomenclature of the Testudinata in the new edition of the 'List of Vertebrates' I have followed very nearly the system adopted by Dr. Strauch in his "Chelonologische Studien," Mém. Ac. St. Pétr. ser. 7, vol. v. (1862), and "Vertheilung der Schildkröten," *ibid.* vol. viii. (1865).

3S. TESTUDO TABULATA, Walbaum.

Duméril and Bibron ‡ make *Testudo carbonaria* of Spix a distinct species from this; and Dr. Strauch follows them in so doing. Dr. Gray, in his recent catalogue, throws the two species together. The examination of two Tortoises purchased for the Society's collection in February§ last, which are since dead, leads me to believe that the former view is correct. As Duméril and Bibron observe, the two animals are unquestionably very nearly allied. But *Testudo carbonaria* is recognizable by its much more compressed shape, blacker

* [In justice to Herr Collett it should be observed that, with the exception of the concluding paragraph, the foregoing paper was in my hands early in June, at which time, I believe, the Philadelphia 'Proceedings' for 1870 had not reached Europe.—A. N.]

† See Part I. Mammals, *anteà*, p. 221, and Part II. Birds, *anteà*, p. 489.

‡ Erp. Gén. ii. p. 99.

§ Purchased Feb. 3, 1871.

general colour, and by the very different form of the head-shields. In *T. tabulata* the frontal or fronto-nasal shield is divided by a median line; in *T. carbonaria* it is entire. This at least is the case with our specimens, just as Duméril and Bibron have remarked.

Our two specimens of *Testudo carbonaria* (purchased February 19, 1869) were said to have been received from Surinam. They were entered in the register as *Testudo tabulata*. Of *T. tabulata vera* one example, purchased Dec. 16, 1870, was obtained on the island of Marajo, Lower Amazon. Mr. E. Bartlett has lent me others for comparison, one of which he obtained in Eastern Peru, where, he tells me, it is the only Land-Tortoise known to occur.

39. TESTUDO ARGENTINA, Sclater.

In my notes on the Tortoises in the Society's Gardens named *Testudo chilensis* by Dr. Gray, which were published in the 'Proceedings' for 1870 (p. 667)*, I showed the improbability of these animals being really natives of Chili, where, according to all the best authorities, no species of Testudinata are known to exist; and in some further remarks on the same subject in the 'Annals of Natural History'† I suggested the alternative name *Testudo argentina* for this species, in case my views should turn out to be correct. Dr. Philippi's letter on the question, stating that the so-called Chilian Tortoises had been obtained from the vicinity of Mendoza, has been already read to the Society‡. Since then I have also made inquiries on the same subject of Mr. Weisshaupt, who himself brought the Tortoises in question to England, and has recently visited us again with a second collection of animals. Mr. Weisshaupt informs me that he procured these Tortoises himself during his expedition to Mendoza; so that there can be no longer any doubt on the subject§. Under these circumstances *Testudo argentina* will be the proper name for the species||.

40. TERRAPENE CARINATA (Linn.).

In the autumn of last year we received three living examples of this Tortoise from Massachusetts, U.S.A., and four from Mexico. All the Mexican specimens had but three claws on the hind feet, and belonged therefore to *Onychotria mexicana*, Gray (= *Cistudo triunguis*, Agassiz). Dr. Strauch, however, contends that this difference is not even specific (Verth. d. Schildkr. p. 45)—a point which I cannot consider yet quite decided.

* In these notes, for *Testudo stellata* in three places read *Testudo sulcata*, as is obvious from the context.

† Ann. Nat. Hist. ser. 4, vol. vi. p. 471.

‡ See *antea*, p. 480.

§ I may add that Mr. Weisshaupt expressly denied ever having given the information regarding these Tortoises quoted by Dr. Gray (Ann. Nat. Hist. Jan. 1871, p. 18). Moreover, as Santiago is not on the coast of Chili, but high in the Andes, and some sixty miles from the Pacific, the circumstances there stated are incorrect on the face of them.

|| See the rules of the Stricklandian code of nomenclature.

41. CINOSTERNUM LEUCOSTOMUM.

In 1870 we received four living specimens of a species of *Cinosternum*, which I had little hesitation in referring to *C. leucostomum* of A. Duméril (Arch. d. Mus. vi. p. 239, pl. xvii.). Two of these were brought from Greytown, Nicaragua, by an officer of one of the Royal Mail Steam-ship Company's vessels, along with an example of *Clemmys ornata*. The other two were purchased out of a ship, with the information that they had come from the Laguna de Terminos, on the coast of Yucatan. Along with the latter were obtained likewise an example of *Clemmys ornata* and a specimen of a *Dermatemys abnormis**. I mention these particulars in order to extend our knowledge of the range of this species, of which M. Duméril's only certain localities are Guatemala (*Morelet*) and New Granada (*Lewy* and *Goudot*). I may add that some of these Tortoises were taken to the British Museum and identified with *Swanka maculata*, Gray†; so that I think it probable that that name is a synonym of *Cinosternum leucostomum*.

42. PODOCNEMIS UNIFILIS, Troschel.

On December 16th of last year we purchased for the Society's collection two small living Tortoises of the genus *Podocnemis*, of which I now exhibit the dried shells, and which I entered in the register of accessions as *Podocnemis expansa* and *P. unifilis*‡. The officer of the steam-ship 'Augustine,' from whom they were obtained, informed me that the former was obtained on the Lower Amazon, and the latter from Purns on the Upper Amazon. In my report on the additions to the Menagerie for December 1870§ I stated in reference to *P. unifilis* that a similar specimen in the British Museum had been referred to the young of *P. dumeriliana*, but that I thought this could be "hardly correct." Dr. Gray, in a recent number of the 'Annals' (ser. 4, vol. viii. p. 68), has endeavoured to prove that this determination (*i. e.* that *P. unifilis* = *P. dumeriliana*, jr.) is correct, and has even come to the conclusion that the character of having only one beard on the lower mandible (whence Prof. Troschel derived his name *unifilis*) so far from being a peculiarity of this species is "common to all the species of the family Peltoccephalidæ," *i. e.* to the genera *Podocnemis* and *Peltoccephalus*, which, in Dr. Gray's latest arrangement, constitute his family Peltoccephalidæ. But I cannot agree to this view. In the first place the *Podocnemis* received along with the specimen of *P. unifilis*, and which I entered as *P. expansa*, has (as you may see by the dried specimen now before you) a distinct double beard, which in the living animal was very prominent, and first called my attention to its specific difference from *P. unifilis*. Secondly, Wagler (Syst. d. Amph.

* Described and figured by Dr. Gray, P. Z. S. 1870, p. 716. pl. xliii., as *Chloromys abnormis*.

† Suppl. Cat. Shield Rep. p. 68.

‡ See P. Z. S. 1870, Appendix, p. 910.

§ See *antè*, p. 26.

pl. iv. fig. 2) most clearly figures a double beard in *P. expansa*. Thirdly, Duméril and Bibron (Erp. Gén. i. p. 584) give as a generic character of *Podocnemis* "*deux barbillons sous le menton*," and again speak of these (*ibid.* p. 385) in describing *P. expansa*. Fourthly, *Peltocephalus*, according to the best authorities, has no chin-beard at all. So that I do not think it can be truly said that the one-bearded chin is a character of the family Peltocephalidæ.

As regards the question whether *P. unifilis* in the stage described by Prof. Troschel (with which the specimen now before me agrees very exactly, except that the spots on the head are bright yellow, not white, the colour in Prof. Troschel's specimen having been probably destroyed in spirit) is a good species, I have not been able to come to a very satisfactory conclusion. We require more information concerning the history of the Amazonian Tortoises and their various stages before we can come to positive results on the subject. Dr. Peters some time ago informed me that he considered *P. unifilis* a good species, and had several specimens in the Berlin Museum; and I see that he has recently recorded the occurrence of a Tortoise on the Ucayali under this name*.

Mr. Edward Bartlett informs me that he believes that he met with four species of the genus *Podocnemis* during his Amazonian travels, namely:—

1. The *Tartaruga grande* or *Cherapa grande*, which is "common all over the Amazons, and grows to a length of 2 feet or more, and lays from 100 to 150 soft round eggs, generally in steep sand-banks." This is no doubt *Podocnemis expansa* (Schweigg.) (= *Emys amazonica*, Spix), Dum. et Bibr. ii. p. 585. There can be no question, I think, that this species always has two barbules under the chin. Spix, it is true, says of it "*gula uniccirrhosa*;" but Wagler, who figures from Spix's specimen, as I have said above, gives *two*.

2. The *Cherapilla*, a smaller species, found on the Huallaga and Ucayali. "It grows to a length of not more than 18 inches, and lays from twenty to forty eggs in rather a deep hole on flat sand-banks." The eggs, of which I exhibit Mr. Bartlett's specimens, are oval, and their shells quite hard; they measure 1.8 in. by 1.35.

This I suppose to be *Podocnemis dumeriliana* (Schweigg.) or *Emys macrocephala* of Spix. Whether this species has one or two barbules on the throat I cannot quite decide. A fine dried specimen (measuring about 16 in. in length of the upper shell) which Mr. E. Bartlett has lent to me has certainly only *one* central barbule. But in the figure of the head of *P. dumeriliana* given by A. Duméril (Arch. d. Mus. vi. pl. xviii. fig. 3) two barbules are plainly shown.

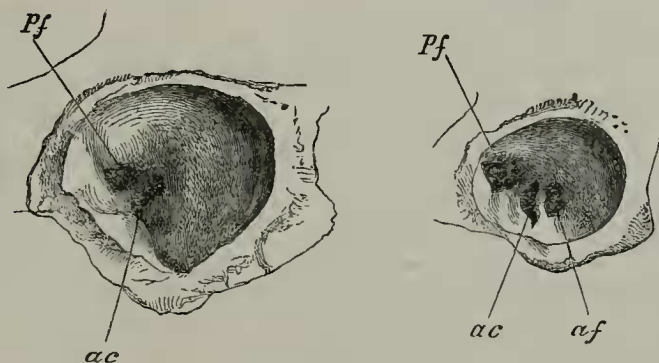
Dr. Gray has pointed out the differences in the form of the ridges on the alveolar surface of the upper jaw which separate this species from *P. expansa*, and which are well shown in the four skulls now exhibited from Mr. E. Bartlett's collection. But Dr. Gray has not remarked on another still more characteristic point

* Monatsb. Ac. Berl. Aug. 3, 1871.

of difference in the skulls of the two species, to which Mr. Bartlett has called my attention. In *P. dumeriliana* there is a large oval fossa (*af*, fig. 2), about two tenths of an inch in depth, immediately in front of the aperture (*ac*) in which the columella is lodged. This fossa does not exist in the skull of *P. expansa* (fig. 1), or at least is only shown by a slight depression of the surface in the same spot. Moreover the large somewhat triangular-shaped fossa behind the aperture (*pf*), which occurs in both species, is very much larger in *P. dumeriliana* than in *P. expansa*.

Fig. 1.

Fig. 2.



Right tympanic rings of *Podocnemis expansa* (fig. 1) and *P. dumeriliana* (fig. 2).
pf. Posterior fossa. *af*. Anterior fossa. *ac*. Aperture of the columella.

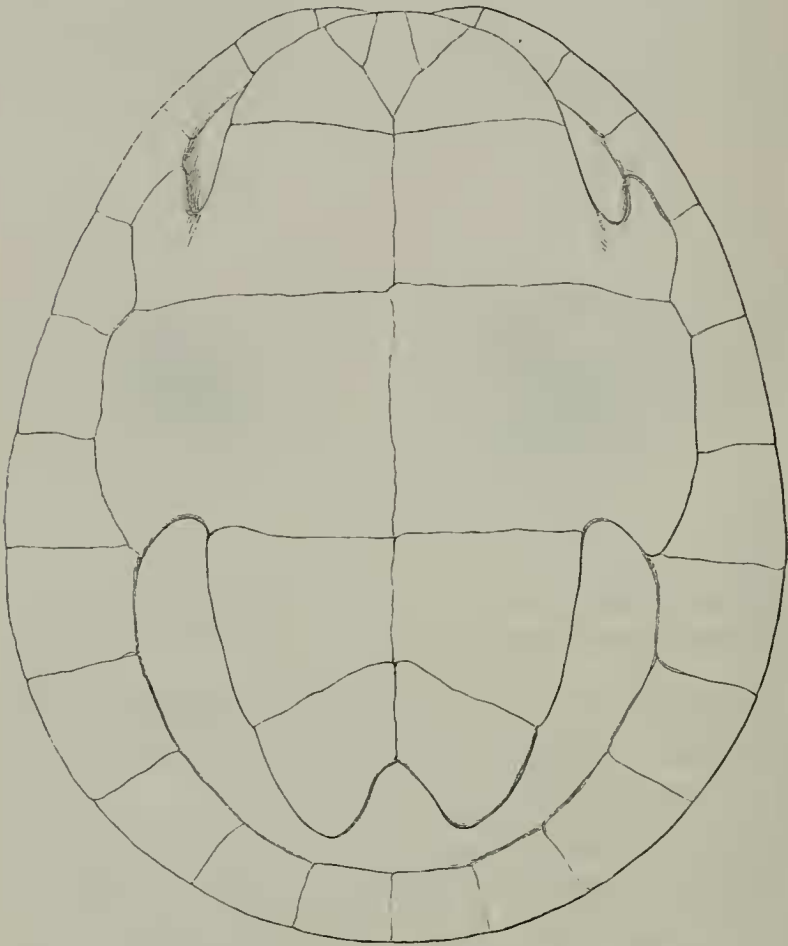
3. The Tortoise recently named by Dr. Gray *Bartlettia pitipii**, which Mr Bartlett met with only near Sarayaçu, on the Ucayali. This, he states, "lays from nine to twelve eggs only, on the flat sandbanks, about fifty or sixty yards from the water." The eggs, of which I exhibit two specimens from Mr. Bartlett's collection, are oblongo-oval in shape and soft-shelled, measuring 1·7 by 0·9 inch.

There is no question about this Tortoise being a *Podocnemis*, in my opinion, and probably of a species different from *P. expansa* and *P. dumeriliana*. But I consider that it may be referable to *Emys erythrocephala* of Spix, with which it agrees in nearly every particular. In the first place Spix's species is unquestionably a *Podocnemis*, but has been referred by some authors to *P. dumeriliana* and by others to *P. expansa*, both of which species Spix has figured under other names. Wagler, who had the advantage of the use of Spix's specimens, says (Nat. Syst. d. Amph. p. 135) "*Emys erythrocephala*, Spix, which belongs to this genus (*i. e.* *Podocnemis*) differs from *Emys expansa* only in the circular excavation at the end of the thorax by the tail. Perhaps this is only individual." The complete specimen of the so-called *Bartlettia pitipii* in the British Museum, as will be seen by the accompanying sketch (fig. 3, p. 748), presents this feature to a certain extent, although not to the extent given in Spix's figure.

* P. Z. S. 1870, p. 720.

The complete specimen of this *Podocnemis* in the British Museum has only one small central mental barbule.

Fig. 3.



Lower surface of shell of *Bartlettia pitipii*, Gray.

4. The fourth *Podocnemis* obtained by Mr. E. Bartlett was the small species, with its brilliantly yellow-spotted head, which Prof. Troschel has described as *Podocnemis unifilis*, and which, as already stated, is labelled in the British Museum as the young of *P. dumeriliana*.

Mr. Bartlett met with this Tortoise on the Ucayali near Sarayacu, and believed his specimens to be full-grown. The specimen lately living in the Society's collection agrees very well with one of Mr. Bartlett's specimens in the British Museum. On examining the other specimens in spirits there, I find two small individuals which I believe to belong to the same species. These are both labelled *P. expansa*.

I think it is possible after all that *P. unifilis* may be only the young of *P. dumeriliana*; but I cannot consider that this is yet proved to be the case.

7. Remarks on a Collection of Birds from Oyapok. By P. L. SCLATER, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received November 29, 1871.]

Madame Adèle Verdey, of 45 Rue Turenne, Paris, has lately sent to me for examination a considerable series of bird-skins collected by one of her correspondents at Oyapok—a place on the river of the same name which divides Cayenne from the northern frontier of Brazil. The collection is of much interest, as containing many forms which I have previously seen only from the Upper Amazons, such as *Euphonia rufiventris*, *Heterocnemis argentata*, *Pipra fli-cauda*, *Celeus grammicus* and others, mixed up with well-known Cayenne species.

There are also two apparently new species in the collection, concerning which I have the following notes to offer.

Family TYRANNIDÆ.

1. OCHTHOËCA MURINA, sp. nov.

Pallide murino-brunnea fere unicolor, pileo obscuriore: alis caudaque nigricantibus, marginibus pallidioribus: loris et oculorum ambitu flavidis: rostro et pedibus nigris: long. tota 5·4, alæ 3, caudæ 2·3.

Hab. Oyapok, Cayenne.

In general colour this species is very much like *Sayornis pallida*, but is rather paler and about half the size. I refer it, however, to *Ochthoëca*, from which the so-called genus *Sayornis* is scarcely separable. When instituting the genus *Ochthoëca* (Wiegman, Arch. 1847, p. 255), Dr. Cabanis assigned to it *Muscicapa saya*, though he subsequently transferred this species to *Aulanax* (J. f. O. 1856, p. 2).

I have at present specimens of the following sixteen species of this genus (in which I now include *Mecocerculus* of my Catalogue) in my collection:—

a. OCHTHODIAËTA, Cab.

1. *O. fumigata* (Boiss.); Cat. A. B. p. 198, ex Columbia et rep. Æquat.

b. OCHTHOËCA, Cab.

2. *O. fumicolor*, Scl. Cat. A. B. p. 198, ex Columb. et rep. Æquat.

3. *O. superciliosa*, Scl. et Salv. P. Z. S. 1870, p. 786, ex Venezuela alta.

4. *O. œnanthoides* (Lafr. et D'Orb.), ex Bolivia alta.
5. *O. polionota*, Scl. et Salv. P. Z. S. 1869, p. 599, ex Peruv. alta.
6. *O. leucophrys* (Lafr. et D'Orb.); Scl. et Salv. P. Z. S. 1867, p. 986, ex Peruv. alta.
7. *O. albidinema* (Lafr.); Scl. Cat. A. B. p. 199, ex Columbia.
8. *O. citrinifrons*, Scl. P. Z. S. 1862, p. 113, ex rep. Æquat.
9. *O. lessoni*, Scl. Cat. A. B. p. 198, ex Columbia alta.
10. *O. nigrita*, Scl. et Salv. P. Z. S. 1870, p. 786, ex Venezuela alta.
11. *O. cinnamomeiventris* (Lafr.); Cat. A. B. p. 199, ex Columbia alta.

c. MECOCERCULUS, Scl.

12. *O. diadema* (Hartl.); Cat. A. B. p. 199, ex Columbia alta.
13. *O. gratioa* (Scl.); P. Z. S. 1862, p. 113, ex rep. Æquat.
14. *O. setophagoides* (Bp.); *Mecocerculus leucophrys*, Scl. Cat. A. B. p. 199 (nec *Fl. leucophrys*, Lafr. et D'Orb.), ex Columbia alta et rep. Æquat.
15. *O. stictoptera* (Scl.); Cat. A. B. p. 199, ex Columbia alta et rep. Æquat.
16. *O. murina*, Scl., ex Cayenna.

I have never been fortunate enough to obtain specimens of the following:—

1. *O. rufipectoralis* (Lafr. et D'Orb.), ex Bolivia.
2. *O. rufo-marginata*, Lawr. Ann. L. N. Y. ix. p. 266, ex rep. Æquat.
3. *O. uropygialis*; *Mecocerculus uropygialis*, Lawr. Ann. L. N. Y. ix. p. 266, ex rep. Æquat.

Family COTINGIDÆ.

2. *HETEROPELMA IGNICEPS*, sp. nov.

Olivaceum: alis caudaque fuscis olivaceo limbatis: pilei cristati plumis mediis late et late croceis, lateribus capitis cineracescenti-olivaceis: subtus valde dilutior, ventre medio et subalaribus flavis: rostro corneo, basi pallidiore, pedibus carneis: long. tota 5·2, alæ 2·8, caudæ 2·1.

Hab. Oyapok, Cayenne.

Obs. Similis *H. flavicapillo* ex Brasil. Merid. Or., sed crista splendide crocea, rostro latiore et ventre flavo differt.

Of this species two specimens are in the collection. It is manifestly a northern form of *H. flavicapilla*, but quite distinct. *H. chrysocephalum* of Pelzeln, of which I have a typical specimen, is much more like *H. aurifrons*; and I am a little doubtful about its real distinctness from that species.

8. Remarks on the Species of the Genera *Myiozetetes* and *Conopias*, belonging to the family Tyrannidæ. By P. L. SCLATER, M.A., Ph.D., F.R.S.

[Received November 28, 1871.]

Mr. G. N. Lawrence, of New York, having kindly sent to me for examination some of the types of his newly described Tyrannidæ, and thus given me the opportunity of comparing them with the specimens in my own collection, I have drawn up a few notes on the species of two allied genera, *Myiozetetes* and *Conopias*, which may, I trust, serve to assist others in the task of determining these difficult birds.

First, as regards *Myiozetetes**, Mr. Salvin and I, in some remarks on *Myiozetetes granadensis* (P. Z. S. 1867, p. 279), have proposed to divide the species of this genus allied to *M. cayennensis* as follows:—

- | | |
|---|---|
| a. Species with a clearly defined white superciliary stripe. | |
| a'. Species with the primaries externally narrowly bordered with rufous, and with the basal half of the inner webs of both primaries and secondaries broadly margined with pale rufous..... | 1. <i>M. guianensis</i> . |
| b'. Species without rufous edgings to primaries, embracing four local forms, which require further examination | 2. <i>M. texensis</i> .
3. <i>M. columbianus</i> .
4. <i>M. cayennensis</i> .
5. <i>M. similis</i> . |
| b. Species without a white superciliary stripe | 6. <i>M. granadensis</i> . |

The examination of the specimens which I have more recently met with, together with the assistance I have received from Dr. Finsch's excellent remarks on this genus (P. Z. S. 1870, p. 569), have induced me slightly to alter my views, and to propose to arrange the species of *Myiozetetes* in the following way:—

- | | |
|---|--|
| a. Superciliis albis. | |
| a'. primariis extus et intus rufo limbatis | 1. <i>erythropterus</i> .
2. <i>rufipennis</i> .
3. <i>cayennensis</i> . |
| b'. prim. extus rufescente intus fulvo limbatis | 4. <i>similis</i> . |
| c'. prim. extus viridi intus fulvo limbatis | 5. <i>texensis</i> . |
| b. superciliis nullis | 6. <i>granadensis</i> .
7. <i>luteiventris</i> .
8. <i>sulphureus</i> . |

At the same time I must say that I am by no means satisfied as to the validity of all the species of section *a*, as in some cases, as I shall presently show, they certainly run into one another.

1. MYIOZETETES ERYTHROPTERUS.

Tyrannula erythroptera, Lafr. Rev. Zool. 1853, p. 56.

Hab. S.E. Brazil; Minas Geraes (*Rogers*).

This species I put first, as having the greatest development of red

* As to the origin of this generic term, see P. Z. S. 1859, p. 46.

on the wings. In *M. erythropterus* nearly the whole of the basal two thirds of the remiges are of a chestnut-red; and a conspicuous red patch on the wing is thus formed. Except in the first primary, the black colour is confined to a very narrow line on each side of the shaft. In the secondaries the outer web is black, narrowly edged with red; the inner web nearly wholly red. The whole wing-end and outer secondaries are black.

I have two specimens of the bird in my collection—one obtained from a dealer, the other transmitted by Mr. Rogers from Minas.

This species (or subspecies of *M. cayennensis*, whichever it may be) is of larger size than *M. cayennensis* from Cayenne. I measure as follows:—

			Long. tota.	Alæ.	Caudæ.
<i>M. erythropterus</i>	Mus. P. L. S.	a	7.0	3.9	3.2
	.....	b	7.5	4.0	3.4
<i>M. "cayennensis"...</i>	Mus. G. N. L. ex Cayenne ...	a	6.2	3.2	2.7
	.....	b	5.7	3.2	2.6
<i>M. rufipennis</i> ...	Mus. P. L. S. ex Venezuela ...	...	6.6	3.5	3.0

2. MYIOZETETES RUFIPENNIS.

Myiozetetes rufipennis, Lawr. Ann. L. N. Y. ix. p. 267.

Myiozetetes cayennensis, Scl. et Salv. P. Z. S. 1868, p. 628.

This form is intermediate between *M. cayennensis* and *M. erythropterus*. Mr. Lawrence's typical specimen agrees very nearly with Goering's skin from San Esteban, which Mr. Salvin and I did not venture to separate from *M. cayennensis*.

M. rufipennis has not quite so much red on the wings as *M. erythropterus*, the dark line adjoining the outside of the shaft of the primaries being broader. Judging from the two specimens examined, the bird is also not quite so long-winged as the Brazilian form.

3. MYIOZETETES CAYENNENSIS.

Muscicapa cayennensis, Linn. S. N. i. p. 327 (ex *M. cayenn.* Briss. Orn. ii. p. 404).

Elcenea cayennensis, Cab. in Schomb. Guian. iii. p. 701.

Myiozetetes cayennensis, Finsch, P. Z. S. 1870, p. 569.

Myiozetetes guianensis, Cab. et Hein. Mus. Hein. ii. p. 61; Scl. P. Z. S. 1860, p. 283; Cat. A. B. p. 219; Scl. et Salv. P. Z. S. 1867, p. 279, 1868, p. 168.

Myiozetetes marginatus, Lawr. Ibis, 1863, p. 182.

I have hitherto applied the Linnean term *cayennensis* to the southern form of *M. texensis*, without rufous margins to the wings. Dr. Finsch, however, in his remarks above mentioned, has shown conclusively that the *Muscicapa cayennensis* of Linnæus (founded on *M. cayennensis* of Brisson) has the remiges externally margined with rufous. There can be no doubt, therefore, that the name *Myiozetetes cayennensis* is correctly applicable to the bird which I have hitherto usually called *M. guianensis*.

Two Cayenne skins of this species are in Mr. Lawrence's collection, and agree very well with specimens in my collection from Bogota and from Panama. Fraser's skins from Babahoyo must also be referred here, although they approximate somewhat to the Venezuelan form (*M. rufipennis*).

The typical specimen of Mr. Lawrence's *M. marginatus* (from Panama) is a young bird in my opinion, showing for that reason narrow edgings to the wing-coverts and broader rufous margins to the tail-feathers. But I cannot separate it specifically from other specimens of *M. cayennensis* from the same district.

4. MYIOZETETES SIMILIS.

Muscicapa similis, Spix, Av. Bras. ii. p. 18, pl. 25.

Muscipeta cayennensis, Lafr. et D'Orb. Syn. Av. i. p. 47 ; D'Orb. Voy. Ois. p. 317.

Tyrannula similis, Hartl. Verz. Mus. Brem. p. 49.

Elænea miles, Burm. Syst. Ueb. ii. p. 474.

Myiozetetes similis, Cab. et Hein. Mus. Hein. ii. p. 61 ; Selater, Cat. A. B. p. 219 ; Finsch, P. Z. S. 1870, p. 569.

Myiozetetes cayennensis, Scl. et Salv. P. Z. S. 1869, p. 598.

In all freshly moulted specimens of the species which I have seen, there are narrow rufescent edgings to the primaries ; and in this stage it is somewhat hard to give good characters to separate it from *M. cayennensis*. It is, however, always of considerably larger dimensions, and has the inner margins of the primaries paler and more of a yellowish than rufous tint. When the rufescent outer edgings of the primaries wear off, the species comes nearer to *M. texensis*, but has the back generally of a darker olive.

Mr. Lawrence sends me a skin of *Myiozetetes* from Peru (Prof. Orton), which agrees very well with others in my collection obtained by Mr. Whitely at Cosnipata in Peru, and by Fraser at Esmeraldas in Ecuador, the latter being a trifle smaller. Mr. Lawrence has given the MS. term *grandis** to his skin ; but I am inclined to refer all three to *M. similis*.

5. MYIOZETETES TEXENSIS.

Tyrannula cayennensis, Sw. Phil. Mag. 1827, i. p. 367.

Muscicapa texensis, Giraud, B. of Texas, pl. 1 ; Selater, P. Z. S. 1855, p. 65.

Elænia texensis, Selater, P. Z. S. 1856, p. 296.

Elænia mexicana, Kaup, in Mus. Berol. et Hein.

Myiozetetes texensis, Selater, P. Z. S. 1859, p. 56, et Ibis, 1859, p. 443 ; Sclat. et Salv. Ibis, 1859, p. 123, P. Z. S. 1870, p. 837 ; Cab. et Hein. Mus. Hein. ii. p. 62 ; Finsch, P. Z. S. 1870, p. 569.

Myiozetetes colombianus, Cab. et Hein. Mus. Hein. ii. p. 62 ; Selater, Cat. A. B. p. 219 ; Scl. et Salv. P. Z. S. 1864, p. 359 ; Salvin, P. Z. S. 1870, p. 196 ; Finsch, P. Z. S. 1870, p. 569.

Myiozetetes cayennensis, Selater, Cat. A. B. p. 219.

* Recently published, see Proc. Ac. Sc. Phil. 1871, p. 234.

Of this species I have examined a large number of specimens (ten in my own collection, and eighteen in that of Messrs. Salvin and Godman), and have quite come to the conclusion that Dr. Finsch is right in saying that the so-called *M. colombianus* is not really separable. The series examined contains skins from every part of the Central American Isthmus, from Southern Mexico down to Panama, and from Columbia, Venezuela, and Trinidad, the last-named locality not being quite certain. The southern specimens are generally smaller in dimensions.

In this bird the remiges are narrowly bordered externally with yellowish, and internally with pale fulvous. In neither case is there any decided rufous tint.

I have a small Bogota skin of this species, which appears to agree very fairly with Heine f.'s description of his *M. icterophrys* (J. f. O. 1861, p. 197); and there are similar skins from Venezuela in Mr. Lawrence's collection. But, in spite of what Dr. Finsch says (P. Z. S. 1870, p. 569), I think the differences are not sufficient to establish a species upon.

6. MYIOZETETES GRANADENSIS.

Myiozetetes granadensis, Lawrence, Ibis, 1862, p. 11; Sclater, Cat. A. B. p. 219; Sclater et Salv. P. Z. S. 1864, p. 359, 1867, p. 979, et 1869, p. 598.

This is a very distinct species, about which there can be happily no question. I have skins of it from Honduras, Panama, Bogota, and Western Peru, and have compared them with Mr. Lawrence's type from Panama.

M. granadensis is readily known from all the preceding species by the entire absence of the white eyebrows. The head is plumbeous, with a concealed median crest of bright scarlet (in the adult), and with the frontal feathers more or less whitish. The back is olive-green. The wings and tail are narrowly edged externally with greenish, and internally more broadly margined with pale yellowish.

7. MYIOZETETES SULPHUREUS.

Muscicapa sulphurea, Spix, Av. Bras. ii. p. 16, pl. 20.

Tyrannula peruviana, Lafr. Rev. Zool. 1853, p. 56.

Myiozetetes sulphureus, Cab. et Hein. Mus. Hein. ii. p. 61; Sclater, Cat. A. B. p. 220; Pelzeln, Orn. Bras. p. 109.

About this species there can be also no question, its great size rendering it at once recognizable*. The concealed crest is of a fine orange-yellow.

Mr. E. Bartlett brought two skins of this *Myiozetetes* in his latest collection from Chamicuros, Eastern Peru, one of which is now in Messrs. Salvin and Godman's collection. The only skin I have is also from Eastern Peru. Natterer obtained this bird in Central Brazil.

8. MYIOZETETES LUTEIVENTRIS.

Elanea luteiventris, Sclater, P. Z. S. 1858, p. 71.

* Long. tota 8, alae 4.3, caudæ 3.1.

Myiozetetes luteiventris, Sclater, Cat. A. B. p. 219; Pelz. Orn. Bras. p. 109.

This species I founded, in 1858, upon a skin, in not very good plumage, obtained, through the Maison Verreaux, from the Rio Napo. I have been recently fortunate enough to find a second example in a collection of birds from Oyapok, in Cayenne, transmitted to me for examination by Madame Verdey of Paris. This second skin is also not quite adult, but shows a small concealed crest, proving that, as H. v. Pelzelin has already pointed out in his remarks (Orn. Bras. p. 109), this species is not different in this respect from other members of this group. I use this specimen to amend the specific characters formerly given, as follows:—

MYIOZETETES LUTEIVENTRIS.

Obscure olivaceus, alis caudaque fusco-nigris, rufescente marginatis: crista pilei celata igneo-rubra flavo mixta: gutture albo; abdomine et subalaribus flavis: remigum marginibus interioribus pallide rufescentibus: long. tota 5·3, alæ 2·75, caudæ 2·3.

Hab. Eastern Ecuador; Rio Negro and Rio Maderira (*Natt.*); Cayenne.

This species forms a very distinct third member of the second section of *Myiozetetes*, without the white superciliaries. It is not unlike *M. granadensis*, but smaller in size and much darker above.

So much for the species of *Myiozetetes*. Of the nearly allied genus *Conopias*, Cab. & Hein.*, I have only recognized one species in my American Catalogue, namely *Conopias superciliosa* = *Tyrannula superciliosa*, Sw. (1841). I now find that Swainson's name must give place to *trivirgata* of P. Max. (1831), this bird being clearly the *Muscicapa trivirgata* of Max. Beitr. iii. p. 871. This synonym was wrongly referred in my American Catalogue to *Myiozetetes similis*.

Closely allied to *C. trivirgata*, but distinguishable by its larger size, white throat, and brown back, is *Myiozetetes inornatus* of Mr. Lawrence. Tschudi's *Tyrannus cinchoneti* (of which I have lately obtained a Bogota skin) seems to be a third allied species. All these three Tyrants have broad and distinct superciliary markings prolonged to the nape, and a dark pileus without any coronal patch. Their synonymy will stand as follows:—

1. CONOPIAS TRIVIRGATA.

Muscicapa trivirgata, Max. Beitr. iii. p. 871 (1831).

Tyrannula superciliosa, Sw. Orn. Dr. pl. 46; Burm. Syst. Ueb. ii. p. 475.

Muscicapa pitangula, Licht. in Mus. Berol.

* Mus. Hein. ii. p. 62 (1859). Mr. G. R. Gray (Hand-list, i. p. 354) seems to give *Myiacleptes* of Reichenbach (1850) priority. But I cannot admit that a mere cut of the head and wing (such as that in Reichenbach's Systema, pl. lx.), without even a type species named, is sufficient to establish a priority.

Conopias superciliosus, Cab. et Hein. Mus. Hein. ii. p. 62 (note);
 Sci. Cat. A. B. p. 221.

Hab. S.E. Brazil (*Max. et Burm.*).

2. CONOPIAS INORNATA.

Myiozetetes inornatus, Lawr. Ann. L. N. Y. ix. p. 268; Finsch,
 P. Z. S. 1870, p. 569.

Hab. Valencia, Venezuela (*Lawr.*); Trinidad (*Finsch*).

3. CONOPIAS CINCHONETI.

Tyrannus cinchoneti, Tsch. Faun. Per. p. 151, pl. viii. fig. 2.

Hab. Peru (*Philippi*); Bogota (*Mus. P. L. S.*).

9. Note on a Variety of *Felis rubiginosa* from Ceylon.

By E. W. H. HOLDSWORTH, F.L.S., F.Z.S., &c.

[Received December 4, 1871.]

Before speaking particularly of this variety it may be desirable to give a short account of what is known of the habits and geographical range of the species.

Felis rubiginosa of Is. Geoffroy is a small species of true Cat, and has apparently but a very limited distribution, being restricted, according to Jerdon, to the Carnatic on the south-east of India and to the island of Ceylon. It has never, I believe, been brought alive to Europe; and specimens are not numerous in museums, either in this country or elsewhere.

In Ceylon, which is peopled by races speaking two very distinct languages, Tamil and Singhalese (the former being the language of the north and the latter of the south, the two overlapping in the central and more civilized districts of the island) this Cat is known to some of the native hunters by the name of *Verewa poony* in Tamil and *Coolla deeya* in Singhalese. In the northern district of Ceylon, however, which generally resembles in character the Carnatic, this species is very rare; and the one example I met with is the only specimen I have heard of that has been obtained in that part of the island. Liberal rewards offered to native hunters, during several months, for specimens alive or dead entirely failed in procuring any more; and the Government Agent of the Northern Province, who had been resident in that large district for very many years, and who, from his official position and known tastes, would be likely to have rarities brought to him, had never seen or heard of this red-spotted Cat until I showed him the specimen I had obtained. It may be considered, therefore, tolerably certain that in that part of Ceylon nearest to India, and resembling it most in physical characters, this species, strangely enough, is almost unknown, although in other respects there is a general similarity in the productions of those parts of the two countries.

The manners of *Felis rubiginosa* are, so far as I have had the means of observing them, those of the true Cats, shown by its stealthy walk and watchful looks above and around it; and I may add that the example I met with, although hit all over by a charge of large shot, fought hard for its life, and some minutes elapsed before I could safely lay my hands upon it. It preys on birds and small quadrupeds.

Although nowhere common in Ceylon, this Cat is found more frequently on the hills than elsewhere; and I have examined three specimens which were procured within a few miles of Kandy, probably at an elevation of from 1500 to 2000 feet. The hill-country, I may mention, occupies the centre of the southern two thirds of the island; and it is from that region that most of the rarer and peculiar members of the Ceylonese fauna are obtained. Jerdon speaks of this animal in India as especially frequenting open grassy places and the neighbourhood of villages, and also mentions, on his own authority and on that of correspondents, that hybrids are not unfrequently produced between this species and the domestic Cat. I have very little doubt that *Felis rubiginosa*, the animal I am now speaking of, is the one to which Jerdon refers; but I must say, from my own experience, and from what I have heard of the animal, that in Ceylon it is a true jungle Cat, and hybrids from it are there unknown. The specimen I shot was walking along one of the ordinary narrow game-paths in wild jungle, more than two miles from the nearest native dwelling; and although I knew of one instance in which it was killed very close to Kandy, that would not lead one to expect this Cat would be generally found in the neighbourhood of towns or villages; for at Kandy the primitive jungle, that which has never been cleared or disturbed, is only separated by a little-frequented road from the gardens of the Governor's official residence; and taking the year round there is hardly any locality in the island which is so productive of rare and peculiar species of birds and quadrupeds as this particular jungle. I have thought it right to mention this, because the distribution and habitats of the Ceylon fauna do not appear to agree in all cases with what are found in other countries producing similar forms.

To return to this Cat: the four examples I saw in the island (one of them killed by myself) agreed perfectly in the characteristic colour and markings of the species; the general ground-colour of the animals was a light greyish fawn, striped on the head and back, and spotted on the sides and legs with bright rusty brown. This general rusty colour of the markings has suggested its specific name, and it is generally known as the Red-spotted Cat.

The late Dr. Kelaart, who with Mr. Edgar Layard did so much towards working out the natural history of Ceylon, mentions, however, in his 'Prodromus Faunæ Zeylanicæ,' that specimens of this Cat from Nuwara Eliya (6000 feet) are darker-coloured and more spotted (probably he meant more distinctly spotted) than those from a less elevation; and I now wish to bring before the Society what I believe is an undoubted example of *Felis rubiginosa*, but which differs so much from the typical character that hardly any trace of rust-colour is

perceptible, and the various markings, although true in position, are almost of a dark brownish black, whilst the original greyish colour of the ground has a larger element of fawn in it.

I have no means of knowing with certainty from what point of the hills this strongly marked variety was procured; but it was recently sent to me from Ceylon, and was obtained from the same person, a collector at Kandy, in whose hands I saw the three specimens previously mentioned. As most of the things which are brought to this person are collected within a radius of twelve or fifteen miles of Kandy, it is very probable that this specimen was not from any of the higher ranges of hills.

P.S.—This variety has been examined by Dr. Jerdon and Mr. Blyth, and has been pronounced by the latter to be the same as that on which he founded his new Indian species, *F. jerdoni* (P. Z. S. 1863, p. 185).

10. Remarks on various Species of Felidæ, with a Description of a Species from North-Western Siberia. By D. G. ELLIOT, F.L.S., F.Z.S., &c.

[Received December 5, 1871.]

(Plate LXXVI.)

Having had occasion lately to visit the Leyden Museum, in order to make some investigations in the difficult group comprising the genus *Felis*, I ascertained some facts which I consider may be useful for naturalists to know, and have therefore embodied them in the present communication. In the 'Monographies de Mammalogie,' published in 1827, Temminck described a Cat under the name of *Felis aurata*, the type of which had been purchased from a London dealer, and its habitat therefore not correctly known. The Golden Cat from Sumatra, Borneo, and Nepal, named by Hodgson *F. moormensis* (P. Z. S. 1832, p. 10), has been considered by mammalogists generally to be the same as the one described by Temminck, and it has been quoted and figured under the name of *aurata* in various publications by the majority of authors. It was therefore with no little surprise that, on seeing the typical *F. aurata* in Leyden, I ascertained that it was not the *F. moormensis* of Hodgson, but a species inhabiting the Gold Coast, which had been named *rutila* by Waterhouse in the 'Proceedings of the Zoological Society' for 1842, p. 130. The two animals from Nepal &c., and from Africa, resemble each other in being both of a general red colour; and therefore it was excusable that authors, judging only from descriptions, and not having seen Temminck's type, should have confounded it with Hodgson's species, which, however, is very distinct. Prof. Schlegel had intended to publish a memoir upon this species of M. Temminck, in order to place the matter in its proper light, but gave up the pro-

ject on learning that I was investigating the group; and I take this opportunity of expressing my thanks for his kindness and assistance during the time I was at work in the magnificent museum over which he so worthily presides.

In the same monograph already mentioned, M. Temminck has also described a Cat, which he procured at the sale of Mr. Bullock's collection in London, as *F. celidogaster*, the habitat being then unknown; but in the 'Esquisses Zoologiques,' published in 1853, p. 86, he redescribes the species from a specimen received from the coast of Guinea. This supposed distinct species, however, proves to be only a light-coloured variety of Temminck's *Felis aurata* from the same locality, as there is in the museum a flat skin, also from the Gold Coast, of a Cat which is intermediate between the two extremes deemed distinct by Temminck. In the 'Annals and Magazine of Natural History' (1838), vol. i. p. 27, Dr. J. E. Gray described a Cat from the Gambia as *F. neglecta*. It was founded on a flat skin wanting the head. By the kindness of Prof. Schlegel I have been enabled to bring the type of *F. celidogaster* to London, and compare it with Dr. Gray's *neglecta*, and I find that the two are identical and cannot be separated. The synonymy, then, of the two species described respectively by Temminck and Hodgson from the Gold Coast and Nepal will be as follows:—

FELIS AURATA.

Felis aurata, Temm. Mon. Mamm. 1827, p. 120; Vig. Zool. Journ. vol. ii. p. 530.

Felis rutila, Waterhouse, Proc. Zool. Soc. 1842, p. 130; Gray, Proc. Zool. Soc. 1867, pp. 272, 395; *id.* Cat. Carn. Mam. 1869, p. 23. sp. 14.

Felis celidogaster, Temm. Mon. Mamm. 1827, p. 140; *id.* Esquiss. Zool. 1853, p. 86 (light variety).

Felis neglecta, J. E. Gray, Ann. & Mag. Nat. Hist. 1838, vol. i. p. 27; Sclat. Proc. Zool. Soc. 1860, p. 246 (light variety).

Felis chalybeata, H. Smith, Griff. Anim. King. 1827, vol. ii. p. 474. pl. (light variety).

General colour above red, indistinctly spotted on the sides, spots small in size; beneath white, spotted with blackish brown; tail red above, white beneath, unspotted; no white marks upon the face, which is of the same red colour as the back and sides.

Hab. Gold Coast of Africa.

FELIS MOORMENSIS.

Felis moormensis, Hodgson, Proc. Zool. Soc. 1832, p. 10.

Leopardus auratus, J. E. Gray, Proc. Zool. Soc. 1867, p. 265; *id.* Cat. Carn. Mam. 1869, p. 12.

Felis aurata, Sclat. Proc. Zool. Soc. 1867, p. 815, pl. 36, et 1868, p. 647; Blyth, Proc. Zool. Soc. 1863, p. 185.

Felis temminckii, Vigors and Horsf. Zool. Journ. vol. iii. p. 451 (jun.).

Upper parts rich brown-red ; ears and tip of tail black ; markings on the face buff, edged with black ; underparts much paler than the upper, inside of the fore legs whitish buff, crossed with several dusky bars ; upper lip pale buff, with three parallel rows of black dots ; lower lip and chin white ; underpart of tail white.

Hab. Nepal, Sumatra, Borneo.

In 1863 Mr. Blyth, in his list of the Asiatic species of the genus *Felis*, published in the 'Proceedings' of the Zoological Society, separated as *F. jerdoni* a small Cat, habitat unknown, but supposed to be the peninsula of India, resembling in size the *F. rubiginosa*, and in markings the *F. bengalensis* of Desm. By the kindness of Mr. E. W. H. Holdsworth, I have been put in possession of two Cats collected by him at Aripo, north-west Ceylon, one of which is typical *F. rubiginosa*, and the other rather intermediate between that species and *F. jerdoni*. This would prove that Mr. Blyth's species is only a dark form of *F. rubiginosa*—a fact not to be wondered at, as dark and light varieties among the species of *Felis* are of very common occurrence. I should state that Mr. Blyth has seen the specimens here alluded to, and agrees with me that his *F. jerdoni* must now be considered the same as *F. rubiginosa*.

The synonymy of the species will be somewhat as follows :—

FELIS RUBIGINOSA.

Felis rubiginosa, I. Geoff. Voy. Bélanger, Zool. p. 140, pl. 6 ; Blyth, Proc. Zool. Soc. 1863, p. 185.

Viverriceps rubiginosa, J. E. Gray, Proc. Zool. Soc. 1867, p. 269 ; *id.* Cat. Carn. Mamm. 1869, p. 18.

Felis jerdoni, Blyth, Proc. Zool. Soc. 1863, p. 185 ; J. E. Gray, Proc. Zool. Soc. 1867, pp. 274, 401.

Leopardus sumatranus, Gray, Cat. Mam. B. M. p. 43.

The dark specimen from Ceylon, although apparently full-grown, is still quite young, the teeth being still those of a kitten.

The remaining species to which I would call the attention of naturalists is one described and figured by Radde, in the 'Reisen im Süden von Ost-Sibirien,' 1862, p. 106, as *Felis undata*, Desmarest. A short time since Mr. A. D. Bartlett, the Superintendent of the Zoological Gardens in Regent's Park, lent me a skin of a Cat, stated to have come from Siberia, which appeared different from any which I had previously seen : but on comparing it with Radde's description of *F. undata* it was apparently the same.

On looking at the original description of *F. undata* ('Nouveau Dictionnaire d'Histoire Naturelle,' vol. vi. p. 115) I found it was established upon a Cat from India, said to be little smaller than the *F. javanensis*, described on the same page, and also compared with the "*Chat sauvage Indien*" of Vosmaer. Judging from the plate, Vosmaer's animal is only a domestic Cat, and at all events is totally different from the animal figured by Radde, which in many particulars does not resemble any Cat known to inhabit India, possessing, among other characteristics, a short rather bushy tail, quite different



J Wolf del J Smut lith

FELIS EUPTILURA

M & N Hanhart imp



from the slender tails of the small Cats which are known to inhabit the southern part of Europe and Asia. Desmarest's name of *undata* will therefore have to become a synonym, probably of *F. javanensis*, if that is allowed to be a different species from *F. undata*, Temm., as his description and plate are so unsatisfactory as to render it impossible to make out what animal was intended; and Radde's species will require a new name, as it is evident it cannot be considered identical with any Indian Cat, nor does it resemble any species yet described from northern Asia. I would therefore propose that it should be known as

FELIS EUPTILURA. (Plate LXXVI.)

Felis undata?, Radde, Reisen im Süden von Ost-Sibirien, 1862, p. 106, pl. 4.

Ground-colour of the body light brownish yellow, strongly mixed with grey, covered with reddish-brown spots rather oblong in shape, darkest and most conspicuous on the hind quarters; head grey, with a white line under the eye and on the side next to the nose; two dark brown stripes in the centre, commencing at the top of the nose, and one on each side beginning at the eye, pass over the top of the head, and down the back of the neck to the shoulders; a dark-red stripe from the corner of the eye runs back across the cheek to the base of the ear; and another rather lighter in colour, starting below the eye, passes across the cheek and curves back under the throat. The centre of the back much darker than the sides, with spots of dark brown. Under lip white, as is also the throat and underparts. Across the upper part of the breast are four broken bands of foxy red; belly covered with large brown spots, becoming rufous between the hind legs. Inner side of hind legs buff, with cross bands of foxy red, and covered with small reddish spots to the toes. Tail thick, rather short, bushy, darker than the body, with several incomplete broken rings of blackish brown. Inside of ear buff, behind black. In size the animal appears somewhat larger than the ordinary domestic Cat. The skin, unfortunately, is in a very bad condition, the hair falling off at the slightest touch.

11. Examination of certain "Remarks on Indian Fishes" made by Mr. Francis Day in the 'Proceedings of the Zoological Society.' By Dr. ALBERT GÜNTHER, F.Z.S.

[Received December 5, 1871.]

At the Meeting of the Zoological Society held Nov. 7th, 1871, a paper by Mr. Day was read, entitled "Remarks on Indian Fishes," in which he attempts to disprove the correctness or justice of some critical observations made by me in the 'Zoological Record' for 1869. Some of these "remarks" do not require a reply, as Mr. Day merely repeats his former statements, and zoologists specially in-

terested in the matter have only to consult what has been written upon it, and then can judge for themselves whether I have misunderstood Mr. Day (which I deny), or whether it is not rather he who has repeatedly misrepresented the author of the 'Catalogue of Fishes'*. But there are other remarks, in which Mr. Day has brought forward fresh facts which, in the interest of truth, must be examined; and being based upon materials in the British Museum, they require notice on my part. They are the following:—

1. *Is the type of Pseudentropius longimanus (Gthr.) one of Colonel Sykes's specimens of Hypophthalmus taakree?*

Mr. Day says:—"Sykes described two species of *Hypophthalmus*, the *taakree* and *goongwaree*, and placed his typical specimens in the collection of the Zoological Society, which was subsequently transferred to the British Museum. Neither of Sykes's typical specimens, however, finds a place in the 'Catalogue of Fishes in the British Museum.' Having been courteously permitted† by Dr. Günther, in 1870, to examine *Pseudentropius longimanus*, Günther (stated in the Catalogue to be '*a. Skin, 6 inches long: not good state. India. From the Collection of the Zoological Society*'), I was surprised to find *it was one of Sykes's specimens*, a fact overlooked when the 'Catalogue' was compiled. Attached to it was the following label:—'*940. Zool. Soc., and 'Hypophthalmus goongwaree (13-6-/57),'* evidently a transposition of labels from the *H. taakree*."

It would seem, at first, almost incredible that this elaborate statement of Mr. Day proceeds entirely from his own imagination and is wholly fallacious.

* Take, for instance, a case from Mr. Day's recent "remarks." He had stated in Proc. Zool. Soc. 1869, p. 371, that *Crossochilus rostratus* (Gthr.) was identical with *Cyprinus bata* (H. B.); and I set him right on this point in the 'Record' for that year in the words quoted by Mr. Day. But, instead of frankly admitting that he had been mistaken in the matter, he states: "As regards *Crossochilus rostratus*, Günther, *from the description as now given, it appears to resemble B. bata, H. B.,* excepting in having a pair of rostral instead of a pair of maxillary barbels." The italics are my own. Now will Mr. Day point out where I have given this second description, or whether I have added one iota to my original description in 1868? and is it not apparent that he intended to convey an erroneous idea to those of his readers who are not acquainted with the details of the history of the fish (for he could scarcely hope that I would accept such an answer), viz. the idea that it was only by the "description as now given" that he was enabled to perceive the difference between the two fishes?

In the first instance, Mr. Day gave as one of the reasons for identifying these two fishes, having found some of his specimens of *C. bata* (?) in the Cossye river, whence the *Crossochilus rostratus* in the British Museum was obtained. This is certainly a point for consideration, but too much weight should not be laid upon it. No doubt Mr. Day, on a visit to a locality, employs every means to collect as many fishes as possible; but it were an illusion to think that he has obtained during a temporary stay all the fishes or even the greater part of the species noticed by previous visitors or residents.

† I accept this as a complimentary remark, but must observe that none of the employés of the Trustees of the British Museum have the power of permitting or denying access to the collections to a student of natural history.